BUSBAR KANAL SİSTEMLERİ

25A-6300A

GÜÇ DAĞITIMINDA EN AKILLI YOL

www.dtmbusbar.com

AB-E SERİSİ / 25A-63A
AYDINLATMA VE GÜÇ
BARALI KANAL SİSTEMLERİ
SF 06-23

SP-H SERİSİ / 100A-160A
DÜŞÜK GÜÇ BARALI
KANAL SİSTEMLERİ
SF 26-37

MP-H SERİSİ / 160A-600A
ORTA GÜÇ BARALI
KANAL SİSTEMLERİ
SF 40-63

HP-K SERİSİ / 400A-6300A
YÜKSEK GÜÇ BARALI
KANAL SİSTEMLERİ
SF 66-122

**KALİTE
STANDARTLARI**
SF 124-125

AB-E SERİSİ 25A-63A

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GENEL ÖZELLİKLER

AB-E DTM Busbar sistemleri 25....63A arası aydınlatma ve güç ihtiyacı olan yerlerde kullanılır.

Teknik Bilgiler

Baralı kanal sistemi muhafazası Galvaniz Sac'tan profil makinasında şekillendirilerek birbirine kenetlenmiş ve mekanik dayanıklılığı artırılmıştır.

İletkenler PVC izolelidir.İletken sayısı L1, L2, L3, N+Pe 4 iletkenlidir.Opsiyonel olarak 5 iletkenli Nötr iletken kesiti faz iletkenlerine eşittir; topraklama olarak gövde kullanılmıştır.

Bütün tasarım ve testler **IEC61439-1/6'** standardına göre yapılmıştır.Herhangi bir busbar uygulaması kapaklı kablo kanalı üzerinden monte edilebilir.Duman, ışık şiddeti gibi değerler bir PLC ve Router yardımı ile kontrol edilebilir.

ISO 9000 Standartlarına uygun ve belgeli kalite güvencesi sistemi ile üretilmektedir.

Avantajlar

Bağlantı Birimleri

Adapte edilebilir aydınlatma sistemi için yer gereksinimlerinden optimum yararlanmaya ve hem yatay hem dikey montaja izin verirler.

Kolay ve hızlı montaj kolayca ve hızla üç aşamada yapılır.

1. Busbar asmak için yerleştirilen askılar.
2. İki busbarı eklemek için bir busbar yay tutucunun pimine takılır.
3. Montaj için herhangi bir uzman takım anahtarı veya ustalık gerekmez.

Busbar Avantajları

Kolaylık

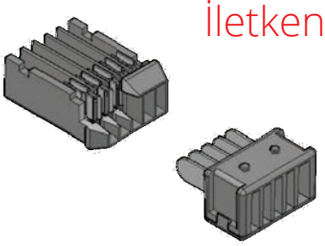
Kolay dizayn edilir güç dağılımı ve temiz network yapısı, kolay mühendislik ve kurma olanağı.

Hızlı

Çok az takım kullanarak hızlı montaj Busbar sistemleri hissedilir ölçüde montaj zamanını azaltır.

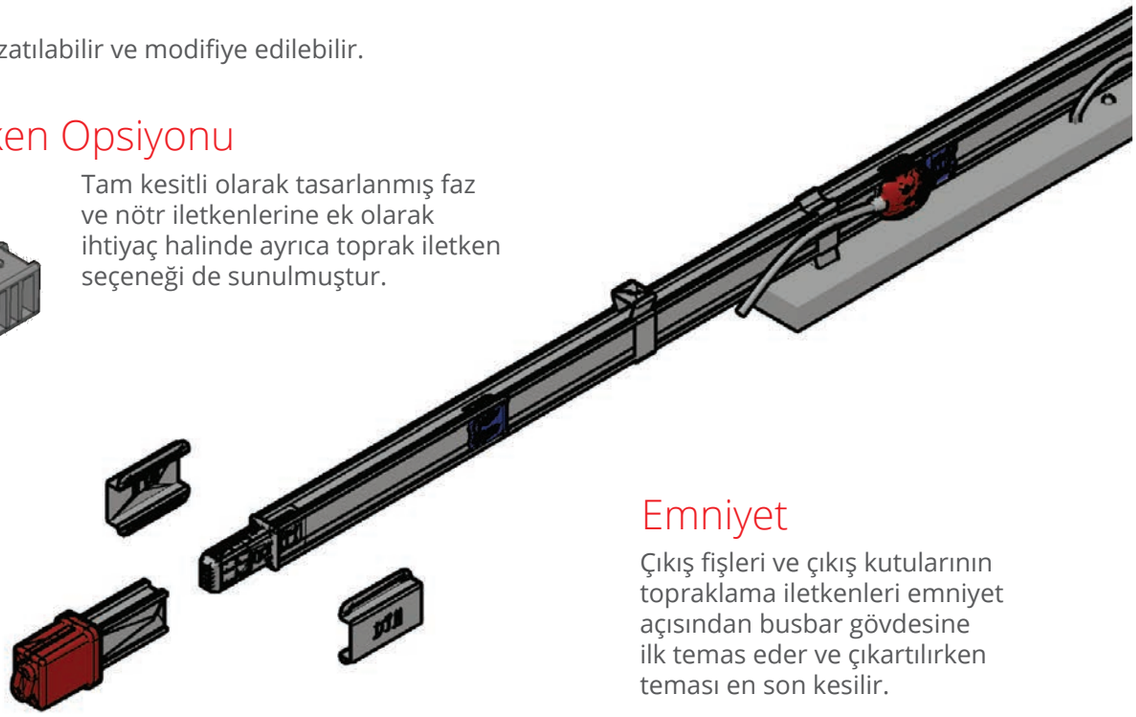
Esnek

Montajlarda kolayca uzatılabilir ve modifiye edilebilir.



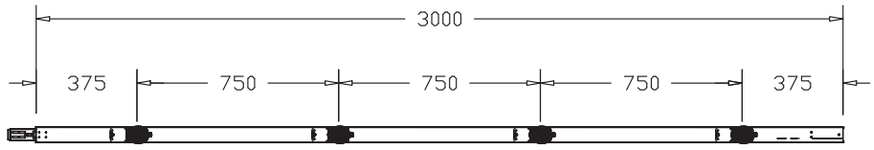
İletken Opsiyonu

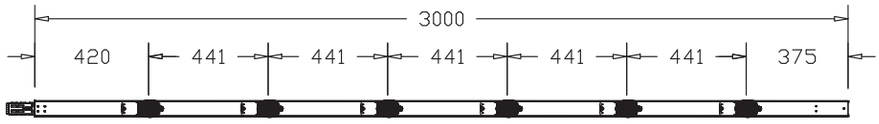
Tam kesitli olarak tasarlanmış faz ve nötr iletkenlerine ek olarak ihtiyaç halinde ayrıca toprak iletken seçeneği de sunulmuştur.



Emniyet

Çıkış fişleri ve çıkış kutularının topraklama iletkenleri emniyet açısından busbar gövdesine ilk temas eder ve çıkartılırken teması en son kesilir.

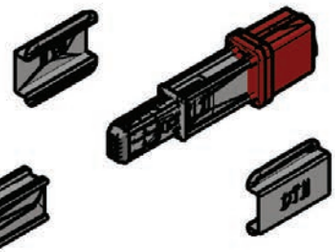


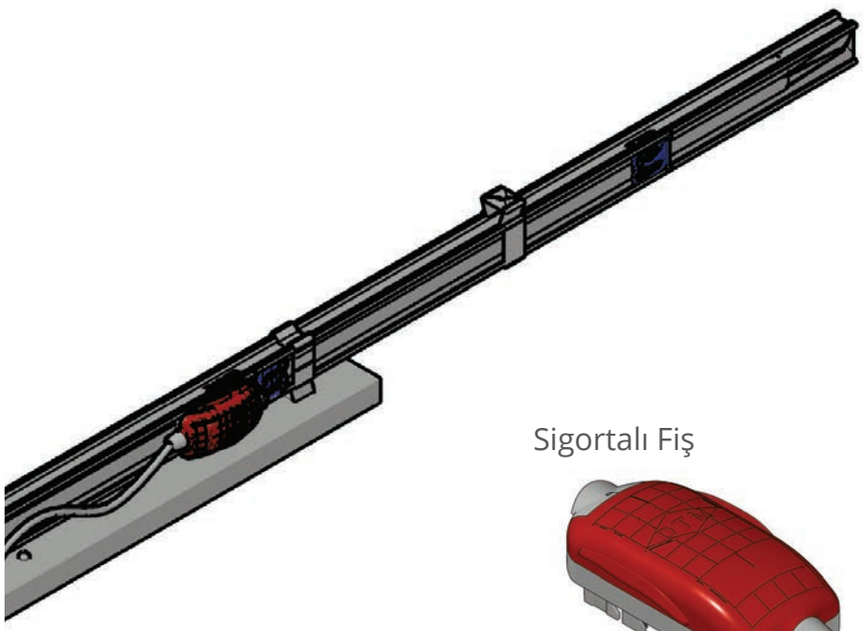


Plug-In Noktalar

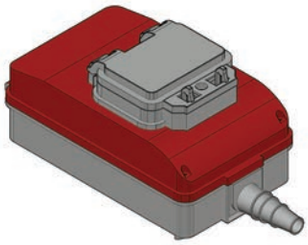
Plug-in Noktalar Standart olarak çıkış noktaları 3 çıkış sağlanmıştır.

İstek üzerine daha fazla Plug-in noktasına sahip standart boy imalatı yapılabilir.





Otomatik Sigorta Kutusu



Sigortalı Fiş

Sigortalı Fiş ve Kutuları

DTM Busbar sistemlerinin çıkış fiş ve kutuları busbarın yanlış kullanımını engellemek amacıyla farklı kontak sırasıyla tasarlanmıştır. Yanlış faz kullanımını engellemek için tüm fiş ve çıkış kutularını sadece bir yönde busbara takılacak şekilde imal edilmektedir.

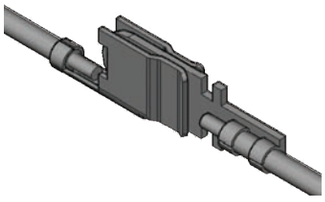
Normal Fiş

Faz Gösterimi İçin Renkli Kapaklar

DTM AB-E Çıkış fişlerinin kapakları armatür hangi fazda besleniyorsa rahatça görebilmeniz için farklı renkte tasarlanmıştır.

Gümüş Kaplı Kontak Uçları

Kontak dirençleri minimuma indirilmiştir.



SİPARİŞ KOD SİSTEMİ

AB-E

Busbar Tipi	AB-E
İletken Cinsi	C
Busbar Akımı	12
Koruma Sınıfı	5
İletken Sayısı	T2
Modül İsmi	PS

Busbar Tipi

BUSBAR ADI

İletken Cinsi

ALÜMİNYUM	(A)
BAKIR	(C)

Busbar Akımı

AB-E CU	
AKIM	BUSBAR KODU
25A	12
32A	13
40A	14
63A	16

Koruma Sınıfı

IP 55	5

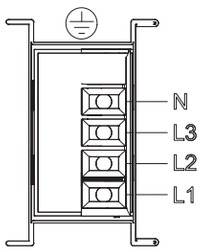
Modül İsmi

Plug-In Busbar	PS
Dönüş Modülü	DM
Plug-In Ara Boy	PX
Çıkış Fişi	F
Baştan Besleme Modülü	BM
Sondan Besleme Modülü	SM
Ortadan Besleme Modülü	OM
Sonlandırma Modülü	S
Askı Takımı	A
Çıkış Fişi Otomat Sigortalı	SF
Ek Kapak	E
U Askı Elemanı	UA
C Askı Elemanı	CA
L Askı Elemanı	LA
Duvar Askı Elemanı	DA
Tavan Askı Elemanı	TA

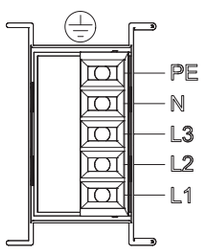
İletkin Sayısı

İLETKEN SAYISI	KODU	L1	L2	L3	N	1/2 TOPRAK	TEMİZ TOPRAK	1/2 TEMİZ TOPRAK	TOPRAK (GÖVDE)
3P+N+PE (4P)	T1	✓	✓	✓	✓				✓
3P+N+PE+FE1 (5P)	T2	✓	✓	✓	✓	✓			✓
3P+N+PE+FE1 (5P) x2	T3	✓	✓	✓	✓	✓	✓		✓

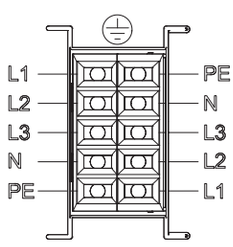
T1



T2

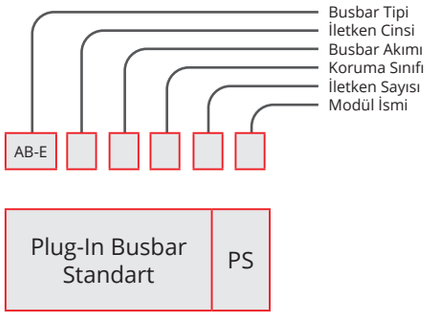


T3



TEKNİK DETAYLAR		AB-E 25	AB-E 32	AB-E 40	AB-E 63
Aktif İletken Sayısı	n° Cu	2	4	5	5
Busbar ebatları	A x B (mm)	39x57.5	39x57.5	39x57.5	39x57.5
Anma Akımı	In (A)	25	32	40	63
Busbar Kesiti (3P+N)	S (mm2)	3.09	3.09	6.11	12.5
Anma İşletme Gerilimi	Ue (V)	400	400	400	400
Anma Yalıtım Gerilimi	Ui (V)	1000	1000	1000	1000
Anma Frekansı	50 Hz f (Hz)	50/60	50/60	50/60	50/60
Anma Kısa Devre Akımı	Icw (kA)rms	2.2	2.5	3.4	4
Tepe Akımı	Ipk (kA)	3.12	3.15	5	5.88
Max. Termal Limiti	I^2 (A^2sx10°)	0.61	0.75	0.99	1.19
Faz Rezistansı	R_{20} (mΩ/m)	4.14	3.695	0.640	1.095
Faz Reaktansı	X (mΩ/m)	4.6	3.695	0.893	1.284
Faz Empedansı	Z (mΩ/m)	8.52	3.695	5.09	1.851
Koruyucu Bara Rezistansı	R_{PE} (mΩ/m)	1.02	1.02	1.02	0.72
Koruyucu Bara Reaktansı	X_{PE} (mΩ/m)	1.08	1.08	1.08	0.075
Arıza Durumu Rezistansı	R_0 (mΩ/m)	7.36	6.55	4.61	3.15
Arıza Durumu Reaktansı	X_0 (mΩ/m)	4.6	6.55	1.83	1.15
Arıza Durumu Empedansı	Z_0 (mΩ/m)	8.52	7.11	5.52	2.6
Dağılmış yük voltaj düşümü	ΔV3F = √3/2 (Rcosø+2x sinø)	5.66	4.85	2.42	1.29
Doğrusal Busbar Ağırlığı	p (kg/m)	1.3	1.4	2.42	2.4
Yanma Yükü	(kWh/m)	0.79	0.79	0.79	0.81
Koruma Sınıfı	IP	55	55	55	55
Anma akımında joule efekt kaybı	P (W/m)	6.9	10.03	13.05	19.9
Ambiet sıcaklık min. / max	t (°C)	-5/+50	-5/+50	-5/+50	-5/+50

Standart Boy

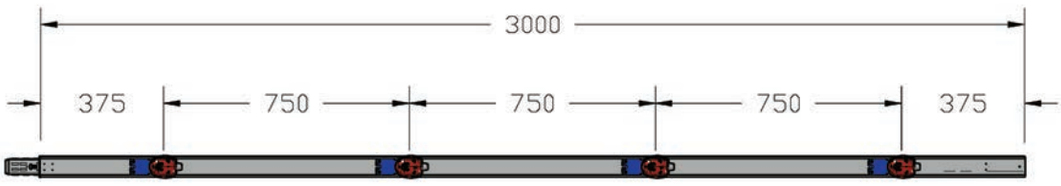


AB-E

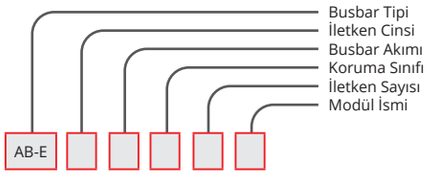
ÖRNEK SİPARİŞ

32 A Bakır
Plug-in IP 55 5 İletken

AB-EC135T2PS



Ara Boy

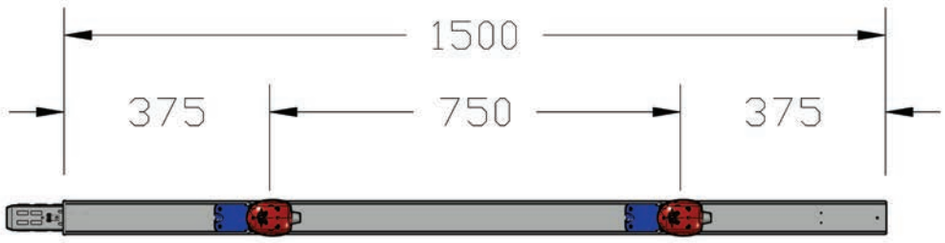


Plug-In Busbar Araboy	PX

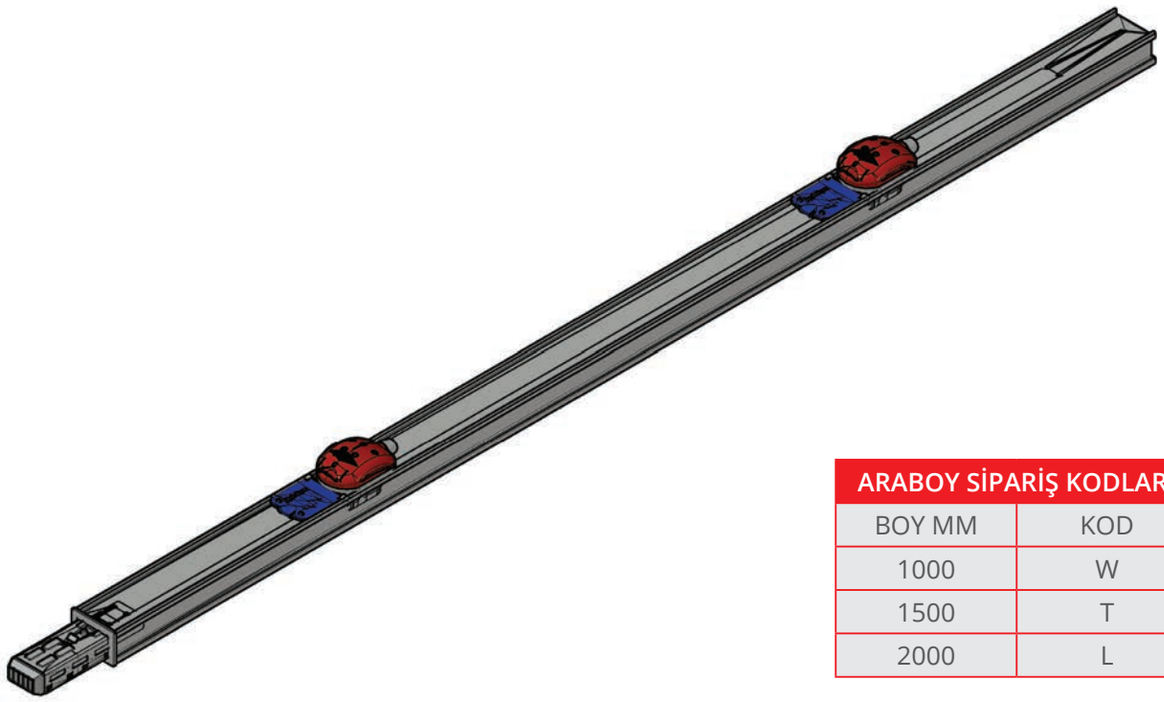
ÖRNEK SİPARİŞ

25 A Bakır
Plug-in Ara boy IP 55 5 İletken

AB-EC125T2PX

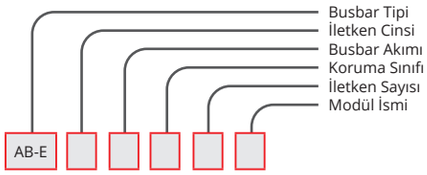


Araboylar Standart olarak 1 mt 1,5 mt ve 2 mt olarak üretilmektedir.



ARABOY SİPARİŞ KODLARI	
BOY MM	KOD
1000	W
1500	T
2000	L

Dönüş Modülleri



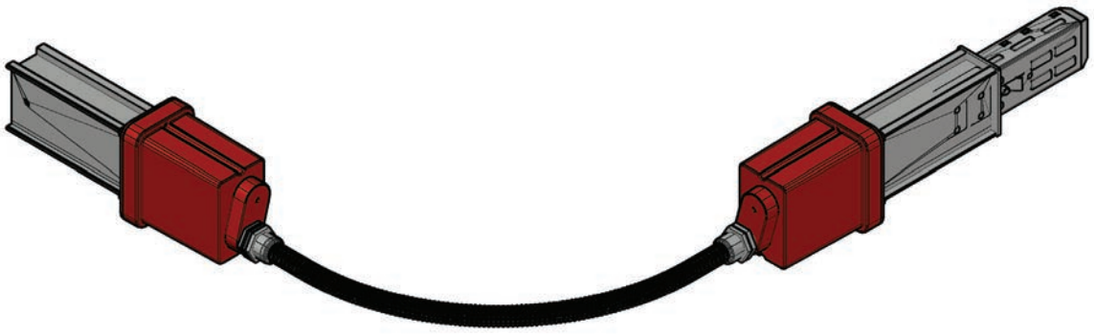
Dönüş Modülü	DM

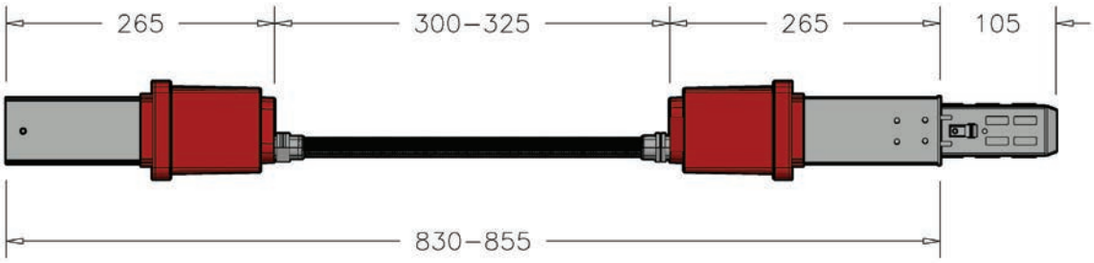
AB-E

ÖRNEK SİPARİŞ

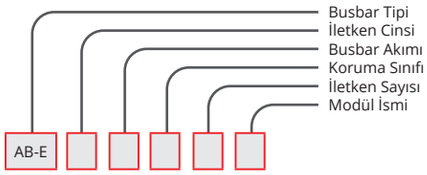
32 A Bakır
Yatay Dirsek IP 55 5 İletken

AB-EC135T2DM





Besleme Modülleri

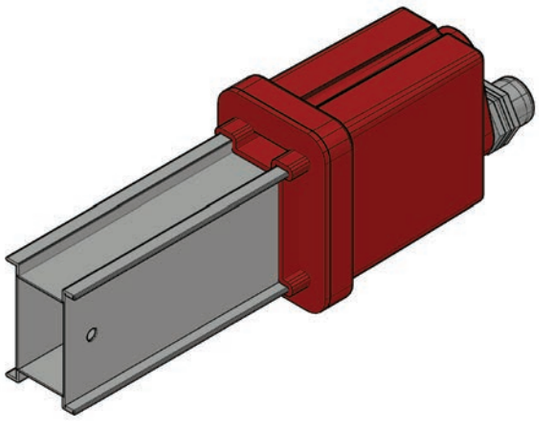


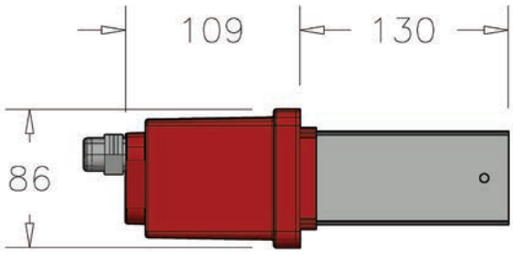
Sondan Besleme Modülü	SM

ÖRNEK SİPARİŞ

40 A Bakır
Besleme Modülü IP 55 5 İletken

AB-EC145T2SM



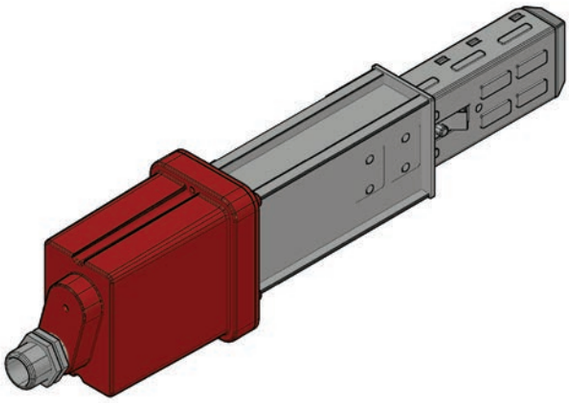


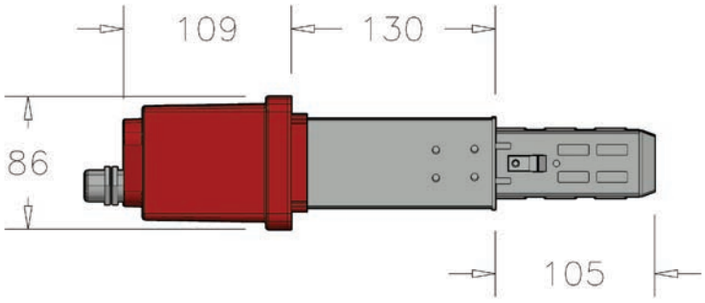
Baştan Besleme Modülü	BM

ÖRNEK SİPARİŞ

25 A Bakır
Besleme Modülü IP 55 5 İletken

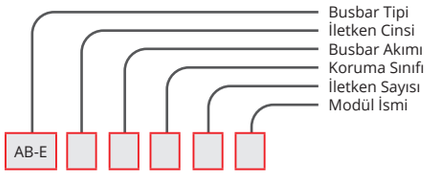
AB-EC125T2BM





AB-E

Ortadan Besleme Çıkış Fişi

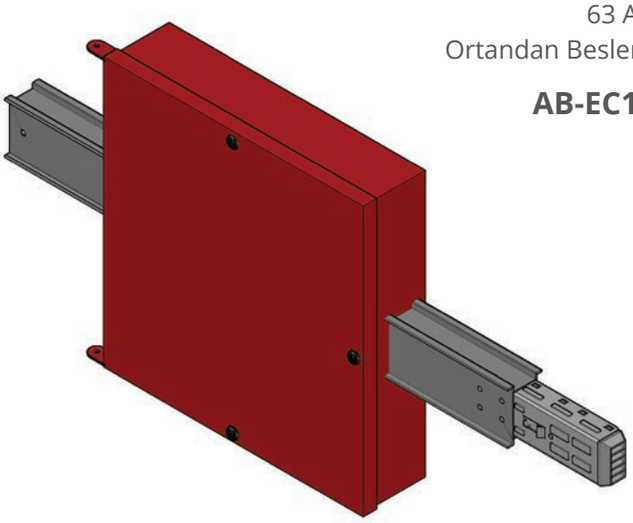


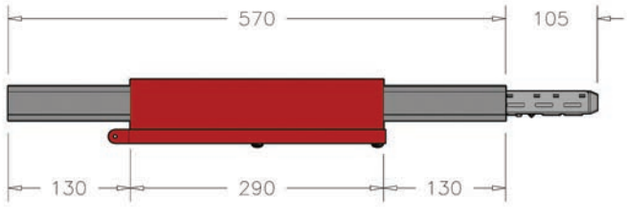
Ortadan Besleme Modülü	OM

ÖRNEK SİPARİŞ

63 A Bakır
Ortandan Besleme IP 55 5 İletken

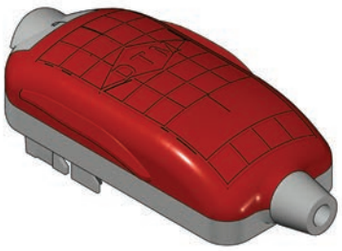
AB-EC165T2OM





Normal Fiş

Sigortalı Fiş

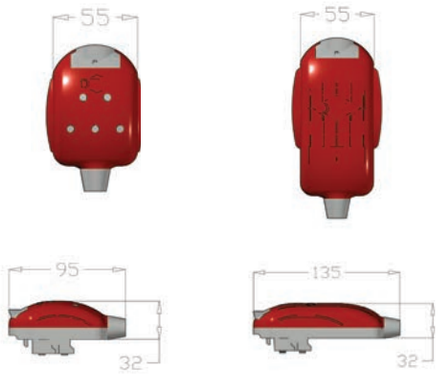


Çıkış Fişi	F

ÖRNEK SİPARİŞ:

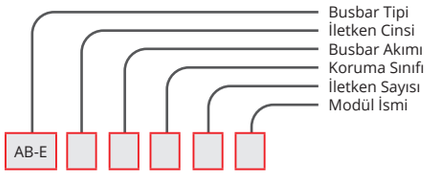
25 A Bakır
Çıkış Fişi IP 55 5 İletken

AB-EC255T212F



ÇIKIŞ FİŞİ		
AMR.	FAZ SIRASI	KOD
10	L1,N,PE	1
	L2,N,PE	2
	L3,N,PE	3
	L1,L2,L3,N,PE	4
16	L1,N,PE	5
	L2,N,PE	6
	L3,N,PE	7
	L1,L2,L3,N,PE	8
25	L1,N,PE	9
	L2,N,PE	10
	L3,N,PE	11
	L1,L2,L3,N,PE	12
32	L1,N,PE	13
	L2,N,PE	14
	L3,N,PE	15
	L1,L2,L3,N,PE	16

Çıkış Kutusu Otomatik Sigortalı



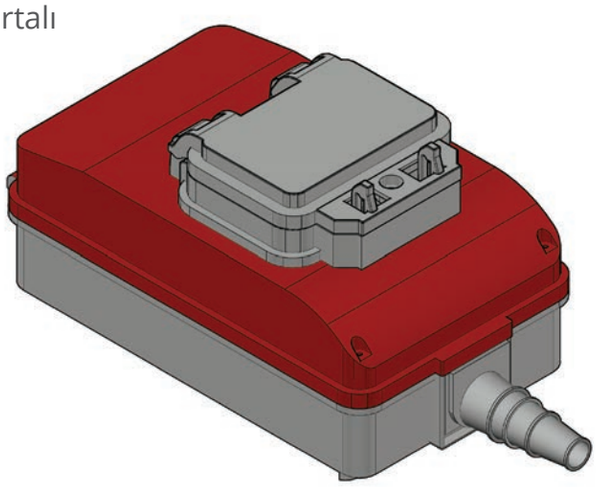
Çıkış Kutusu Otomat Sigortalı	SF

ÖRNEK SİPARİŞ

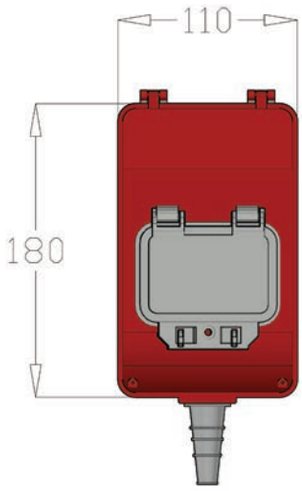
32 A Bakır
Çıkış Kutusu IP 55 5 İletken

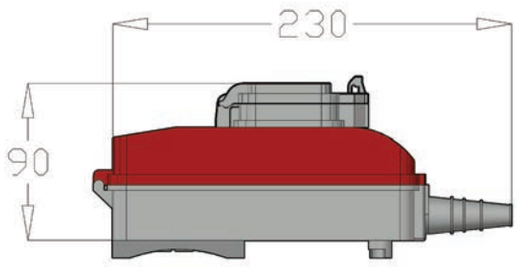
AB-EC325T232SF

Otomatik Sigortalı

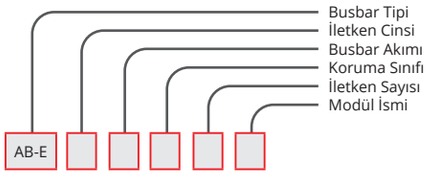


ÇIKIŞ FİŞİ		
AMR.	FAZ SIRASI	KOD
10	L1,N,PE	17
	L2,N,PE	18
	L3,N,PE	19
	L1,L2,L3,N,PE	20
16	L1,N,PE	21
	L2,N,PE	22
	L3,N,PE	23
	L1,L2,L3,N,PE	24
25	L1,N,PE	25
	L2,N,PE	26
	L3,N,PE	27
	L1,L2,L3,N,PE	28
32	L1,N,PE	29
	L2,N,PE	30
	L3,N,PE	31
	L1,L2,L3,N,PE	32





Sonlandırma Modülü Ek Kapakları

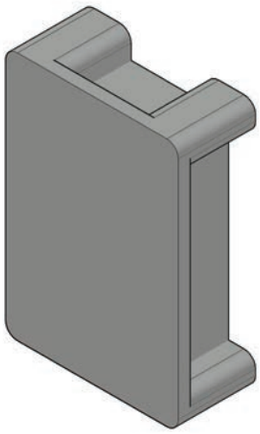


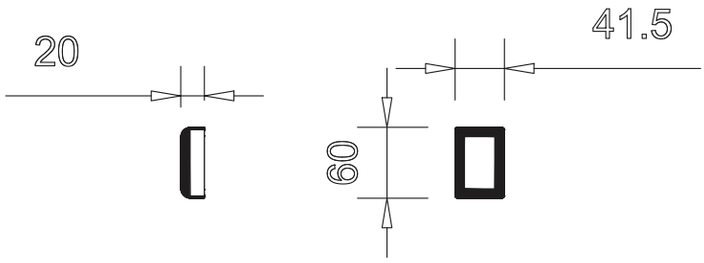
Sonlandırma Modülü	S

ÖRNEK SİPARİŞ

32 A Bakır
Sonlandırma IP 55 5 İletken

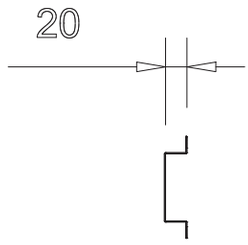
AB-EC135T2S

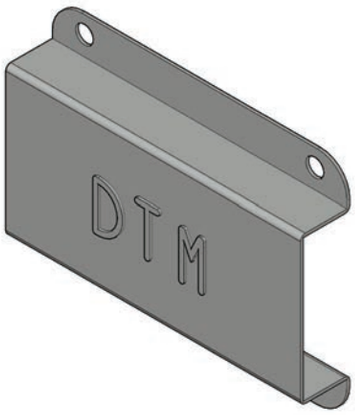


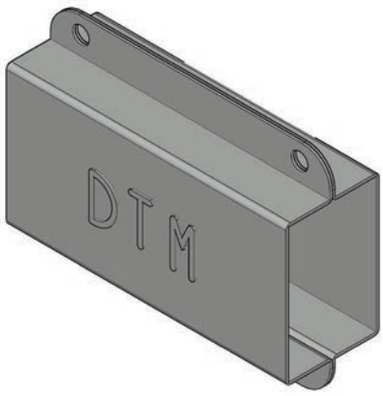


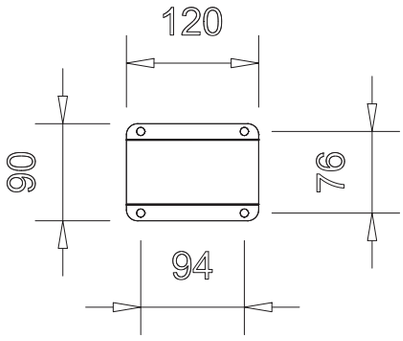
Ek Kapak	E

AB-EC5T2E

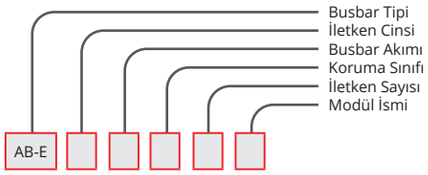






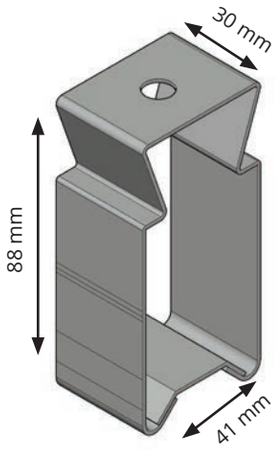


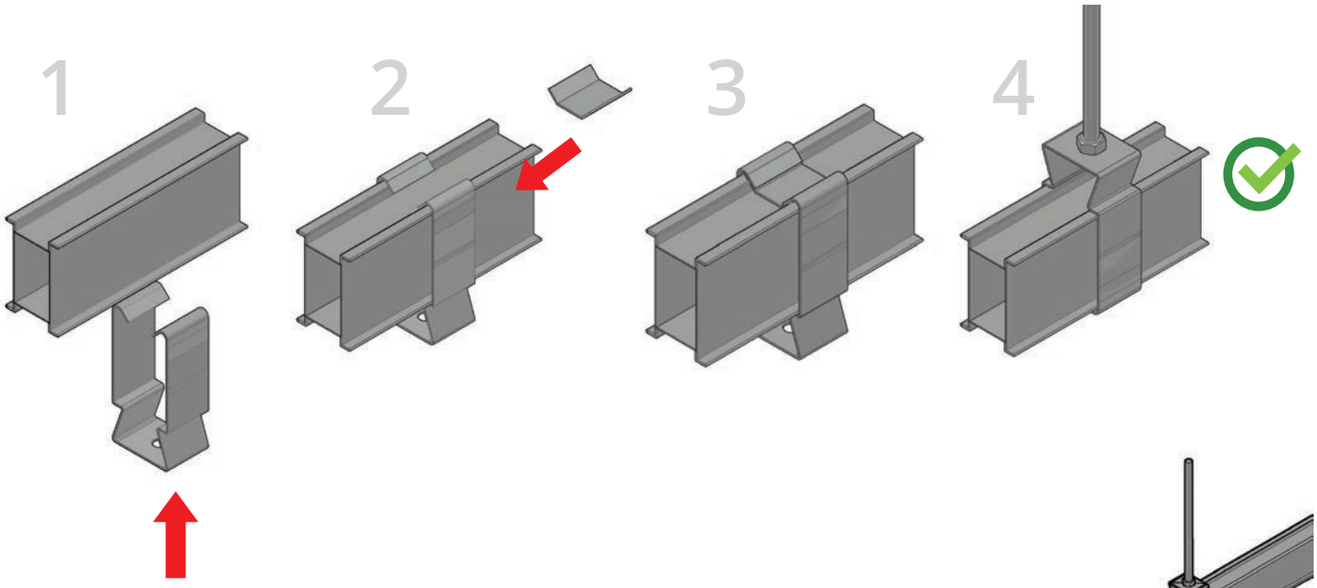
Busbar ve Armatür Askısı

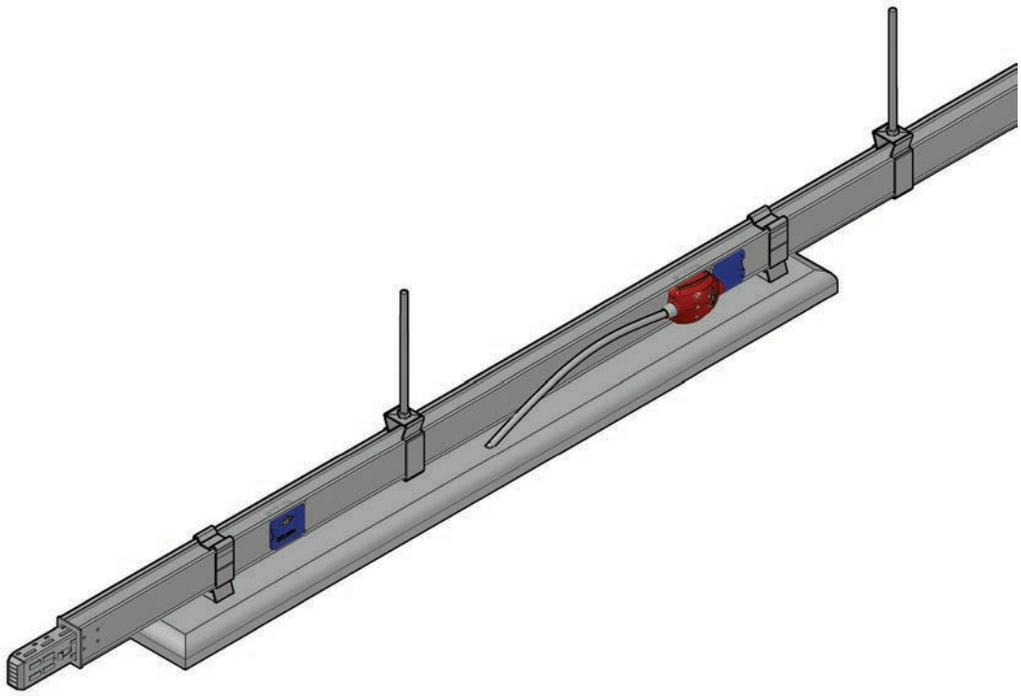


Askı Elemanı (U)	UA

AB-EUA

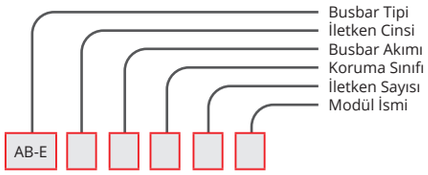






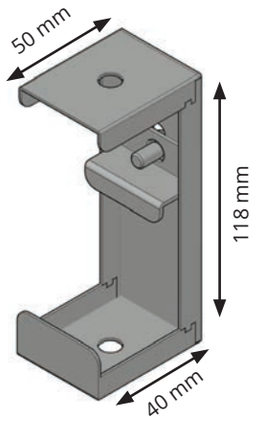
AB-E

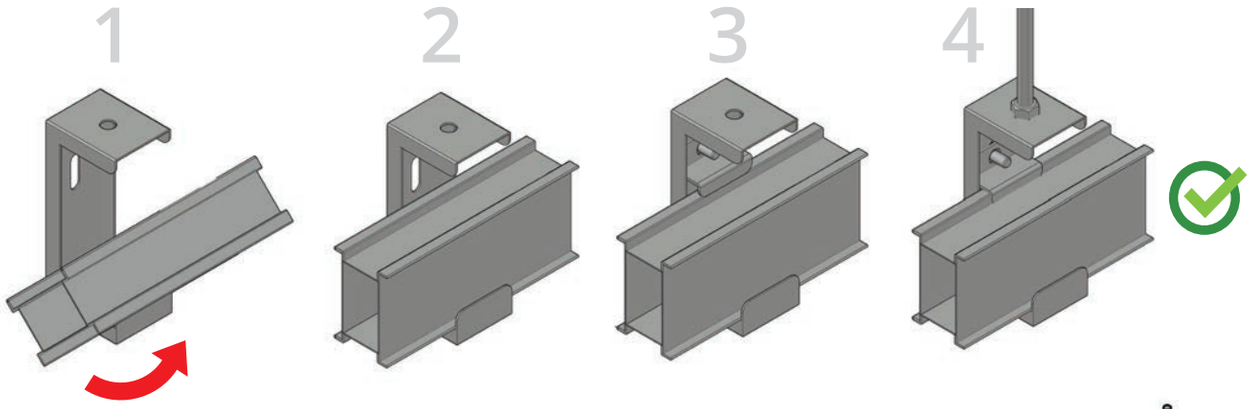
Busbar ve Armatür Askısı

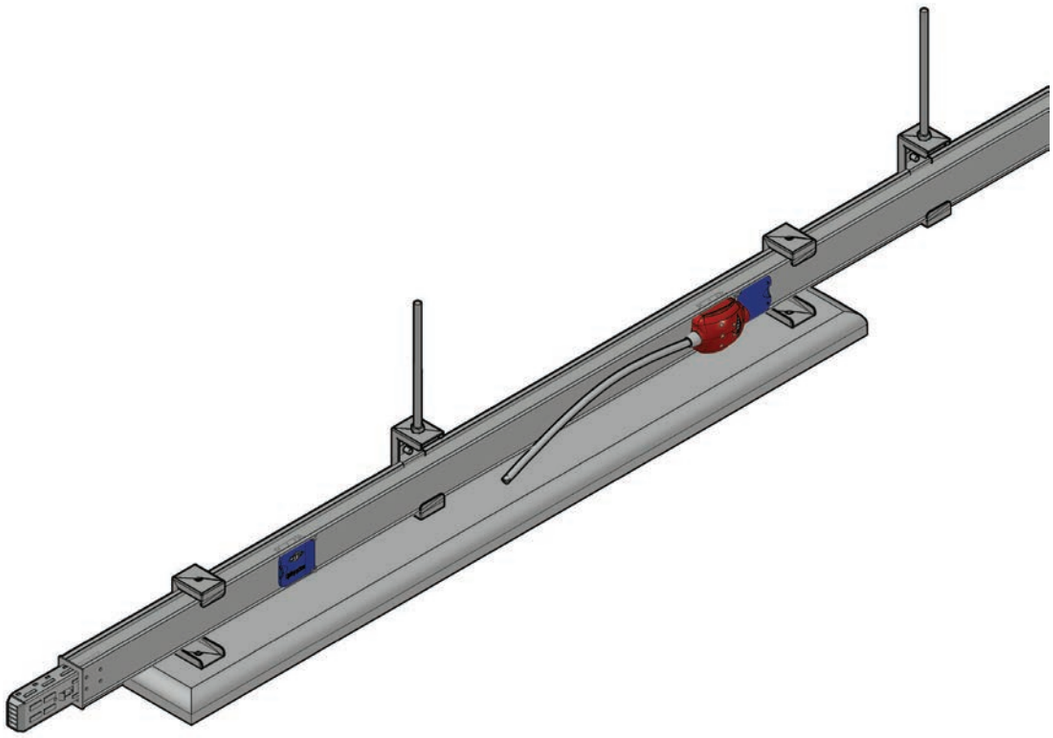


Askı Elemanı (L)	LA

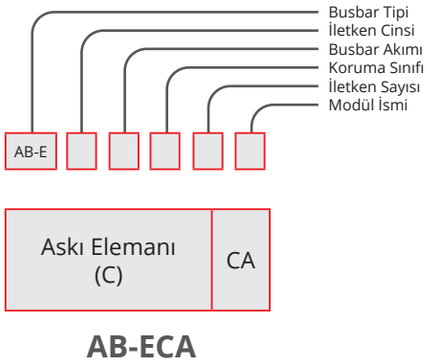
AB-ELA



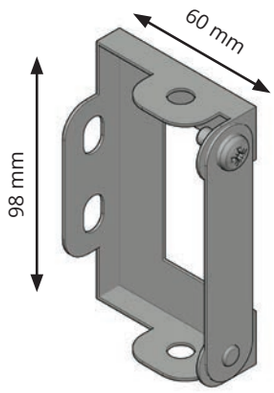


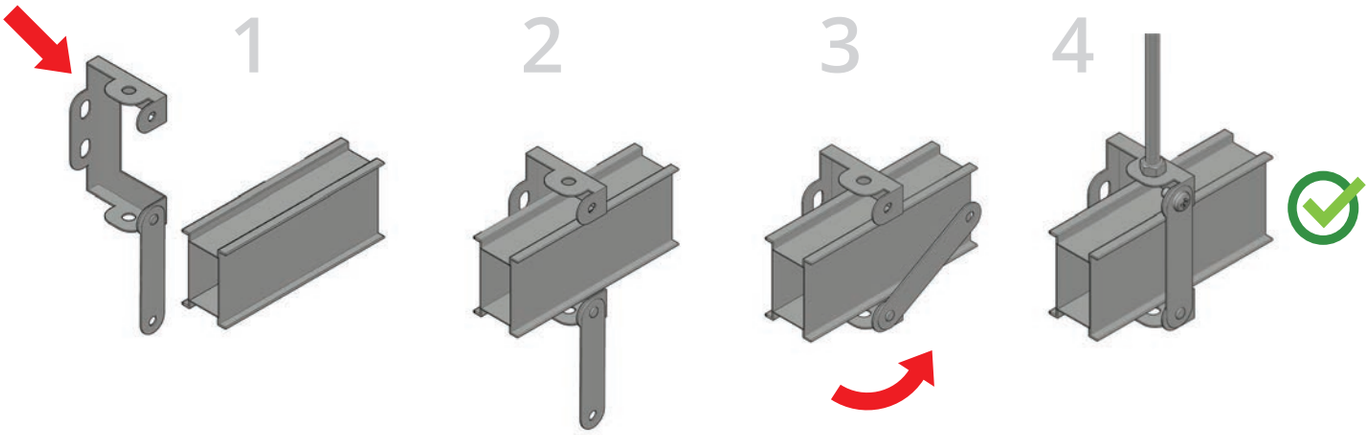


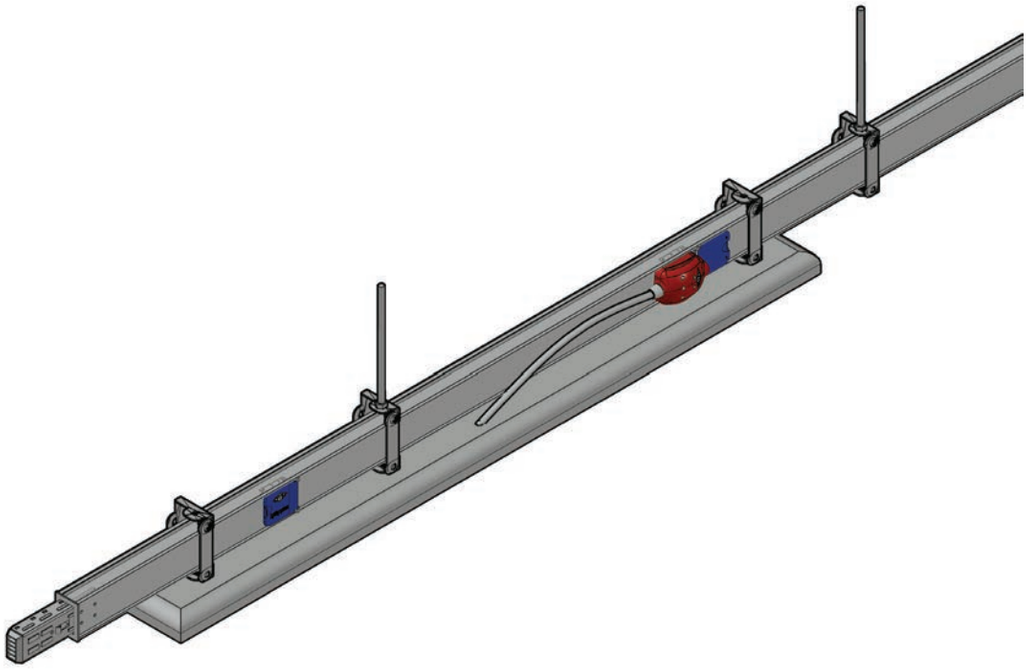
Busbar ve Armatür Askısı



AB-ECA

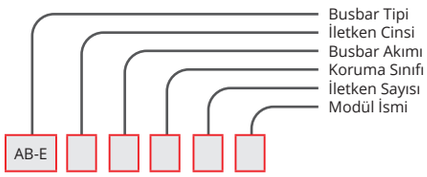






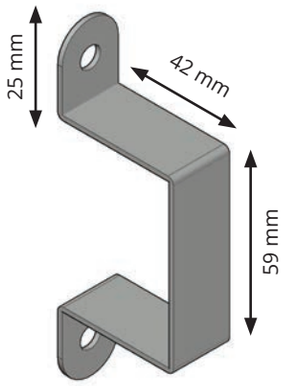
AB-E

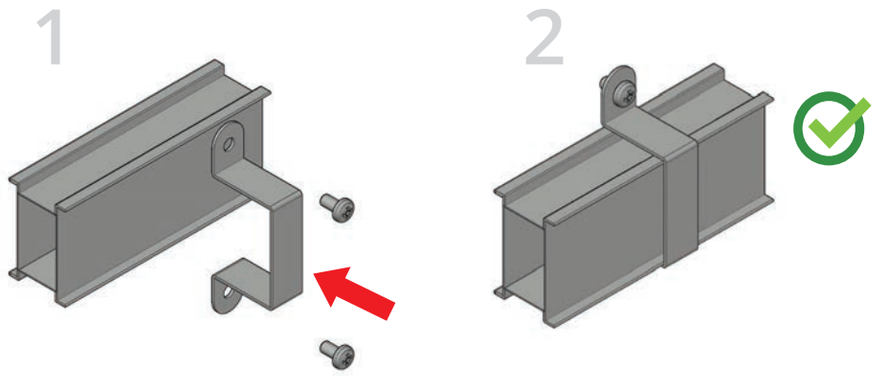
Askı Elemanları



Askı Elemanı Duvar Tipi	DA

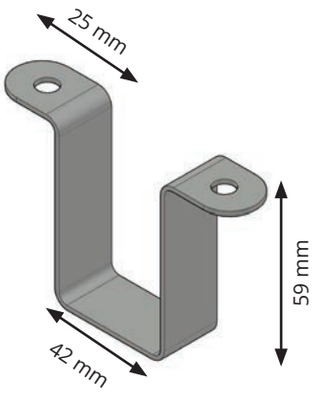
AB-EDA

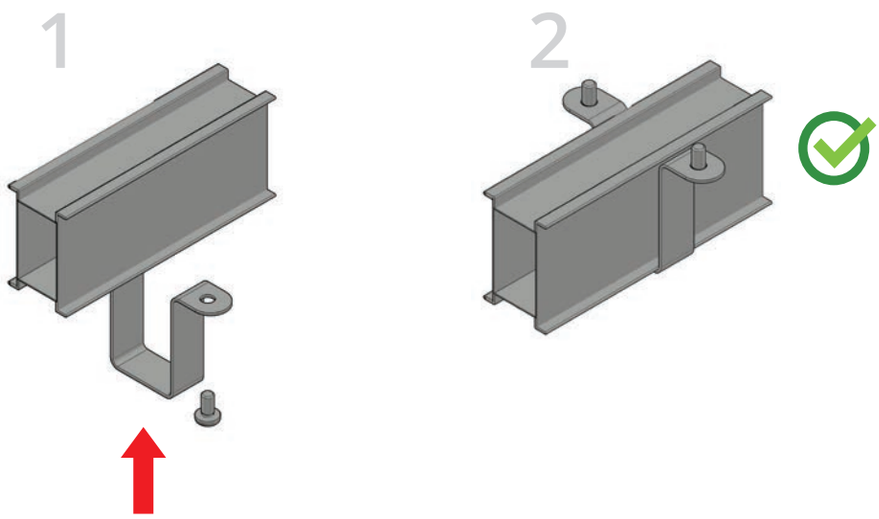




Askı Elemanı Tavan Tipi	TA

AB-ETA





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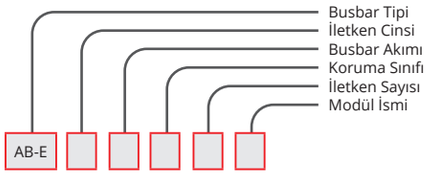
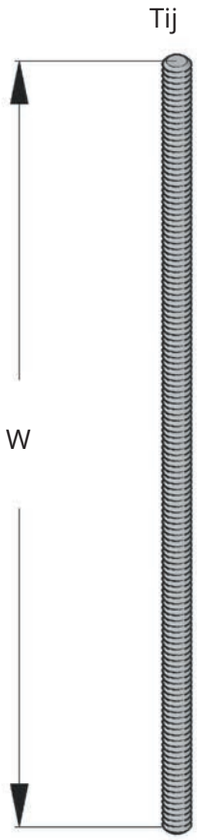
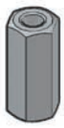


Askı Elemanı	T

AB-ET



Uzatma Elemanı



Çelik Dübel

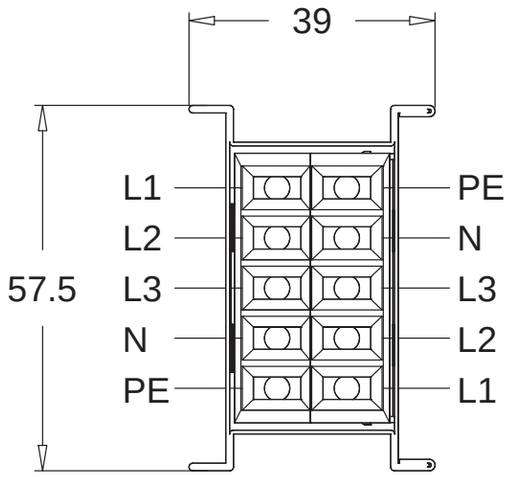
Çelik Somun

Pul

BAĞLANTI ELEMANLARI		
AÇIKLAMA	W (mm)	Kodu
B-E 8 Tij Askı (M8)	500	T101
B-E 8 Tij Askı (M8)	1000	T102
(M8) Uzatma Elemanı	-	T103
M 8 Çekmeli Dübel	-	T104
M 8 Çelik Somun	-	T105

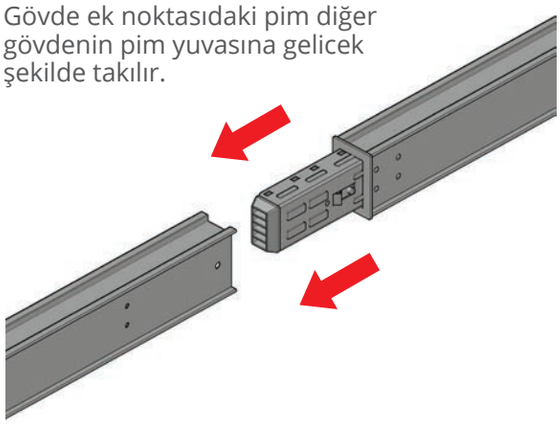
Busbar Teknik Bilgiler

BAKIR BUSBAR EBAT VE AĞIRLIKLARI					
AMPER SINIFI	BUSBAR mm			FEEDER KG	
				3P+N+PE (4)	3P+N+PE+FE1 (5)
25A	39	X	57.5	1.15	1.18
32A	39		57.5	1.19	1.3
40A	39		57.5	1.40	1.5
63A	39		57.5	1.48	1.55

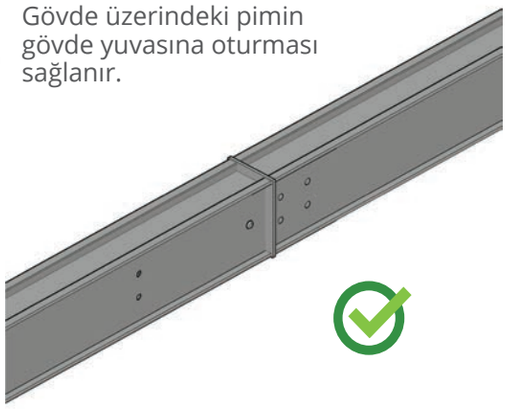


Montaj Şekli

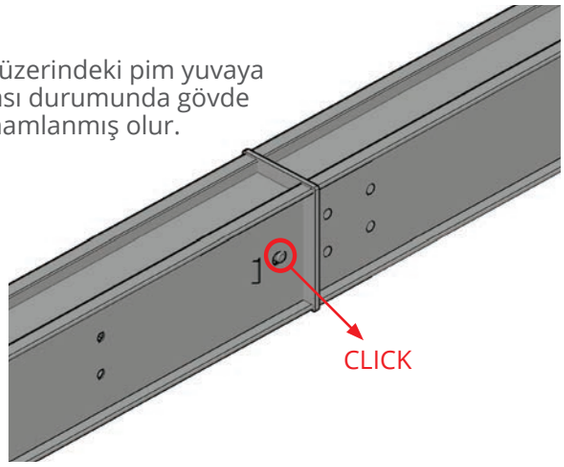
1 Gövde ek noktasıdaki pim diğer gövdenin pim yuvasına gelicek şekilde takılır.



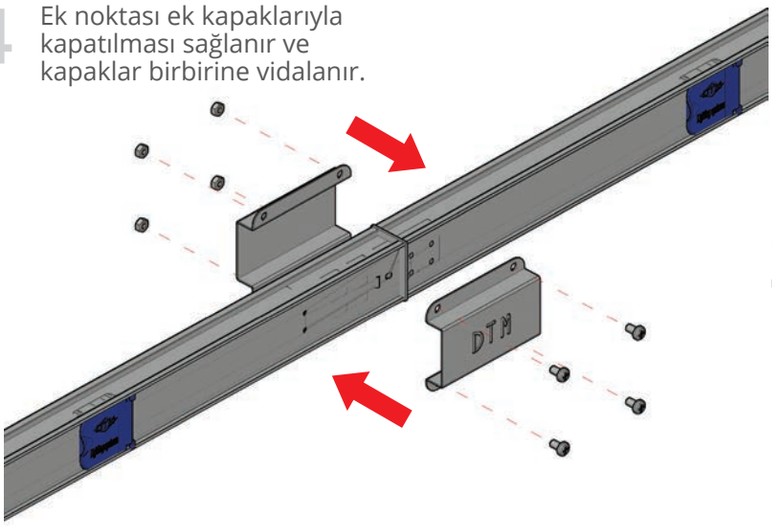
2 Gövde üzerindeki pimin gövde yuvasına oturması sağlanır.



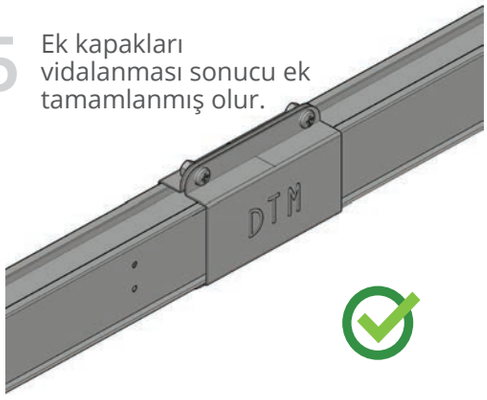
3 Gövde üzerindeki pim yuvaya oturması durumunda gövde eki tamamlanmış olur.



4 Ek noktası ek kapaklarıyla kapatılması sağlanır ve kapaklar birbirine vidalanır.



5 Ek kapakları vidalanması sonucu ek tamamlanmış olur.



AB-E

SP-H SERİSİ 100A-160A

Genel Özellikler 26
Proje Bilgileri 27
Aksesuarlar
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Ara Boy 30
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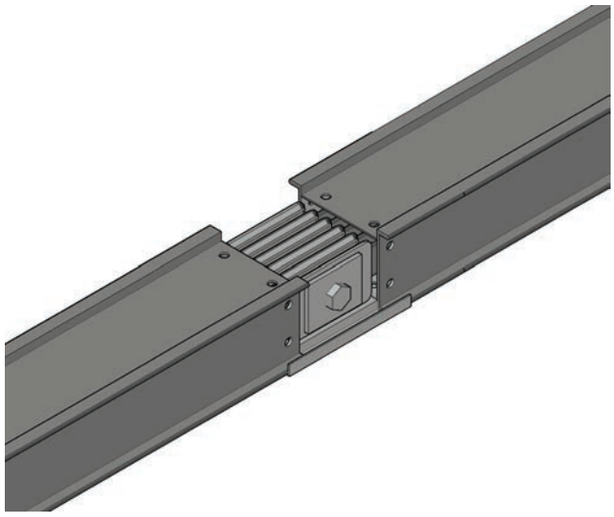
Dilatasyon Modülü 32
Çıkış Kutusu Plastik 33
Besleme Modülleri 34
Teknik Bilgiler
Busbar Teknik Bilgiler 36
Montaj Bilgileri
Montaj Şekli 37

GENEL ÖZELLİKLER

DTM SP-H 100A -160A Busbar kanal sistemi enerji dağıtım ihtiyacının olduğu yerde elektrik dağıtım hattı olarak kullanılır. Dış gövde standart galveniz sac veya RAL7038 boyalı üretilmektedir.

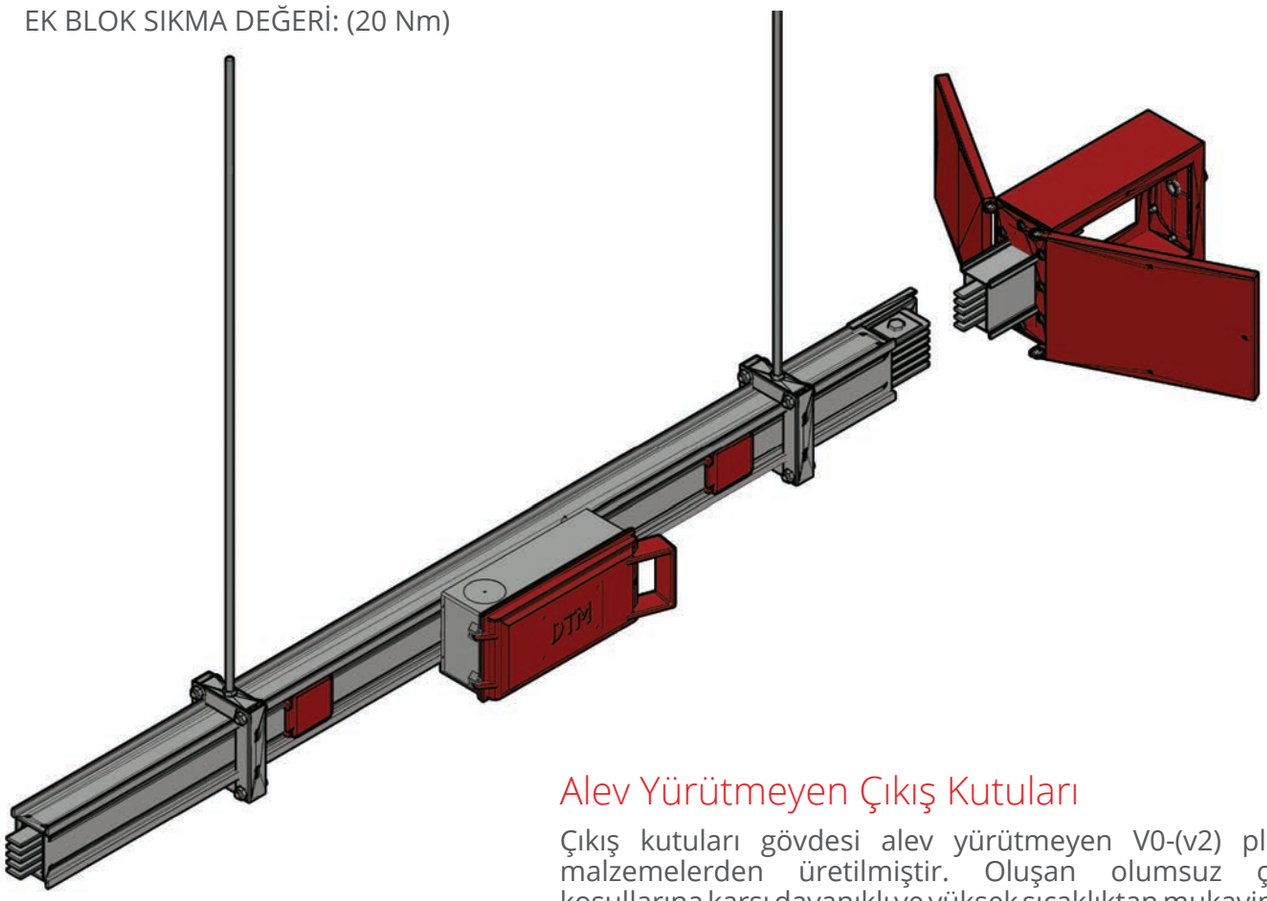


Blok Sistemi

Geçmeli vidalı sistemle montaj kısa sürede güvenle yapılır.

Vida somunla sıkılarak kullanılır.

EK BLOK SIKMA DEĞERİ: (20 Nm)



Alev Yürütmeyen Çıkış Kutuları

Çıkış kutuları gövdesi alev yürütmeyen V0-(v2) plastik malzemelerden üretilmiştir. Oluşan olumsuz çevre koşullarına karşı dayanıklı ve yüksek sıcaklıktan mukavimdir.

Çıkış kutularıyla 80 A'e kadar akım almak mümkündür.

Çıkış kutuları hiçbir eleman gerektirmeksizin kolayca ve güvenli monte edilir.

SİPARİŞ KOD SİSTEMİ

SP-H	A	16	5	T2	F	

- Busbar Tipi
- İletken Cinsi
- Busbar Kodu
- Koruma Sınıfı
- İletken Sayısı
- Tipi P-Plug-in/F-Feeder
- Modül İsmi

Busbar Tipi

BUSBAR ADI

İletken Cinsi

ALÜMİNYUM (AL)	(A)
BAKIR (CU)	(C)

Busbar Akımı

SP-H AL		SP-H CU	
AKIM	BUSBAR KODU	AKIM	BUSBAR KODU
100	10	100	11
160	16	160	17

Koruma Sınıfı

IP 55	5

İletkin Sayısı

İLETKEN SAYISI	KODU	L1	L2	L3	N	1/2 TOPRAK	TEMİZ TOPRAK	1/2 TEMİZ TOPRAK	TOPRAK (GÖVDE)
3P+N+PE (4P)	T1	✓	✓	✓	✓				✓
3P+N+PE+FE1 (5P)	T2	✓	✓	✓	✓	✓	✓		✓

Modül İsmi

Feeder Busbar	FS
Plug-In Busbar	PS
Yatay Dirsek	YD
Dikey Dirsek	DD
Feeder Ara Boy	FX
Plug-In Ara Boy	PX
Çıkış Kutusu Plastik	KP
Baştan Besleme Modülü	BM
Sondan Besleme Modülü	SM
Ortadan Besleme Modülü Sağ	BR
Sonlandırma Modülü	S
Dilatasyon Modülü	D
Askı Takımı	A
Ortadan Besleme Modülü Sol	BL

Tipi
Busbar Kullanım Amacı ile İlgili Bilgiler.

(P) PLUG-IN DÜZ BOYLARDA PLUG-IN YERLERİNDEN AKIM ALINMASINDA KULLANILIR.
(F) FEEDER DİREK BESLEME YAPILAN YERLERDE KULLANILIR.

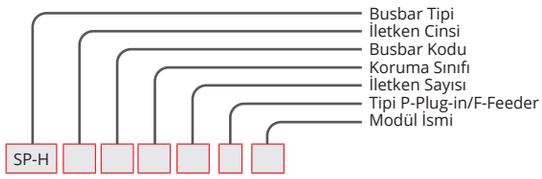
Tipi P-Plug-in / F-Feeder

SP-H

TEKNİK TABLO & TECHNICAL TABLE (SP-H AL)				
ALÜMİNYUM İLETKEN (AL)				
Beyan Akımı	In	A	100	160
Busbar Kodu			SP-HA10	SP-HA16
Koruma Sınıfı	IP55			
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1			
Maks.Beyan Çalışma Gerilimi	Ue	Vac	690	400-1000
Beyan Darbe Dayanım Gerilimi	Uimp	kV	8	400-1000
Beyan Frekansı	f	Hz	50	400-1000
Beyan Yalıtım Gelirimi	Ui	V	1000	Kategori IV
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK10			
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS-HD 60364-4-41, madde A1)			
Beyan Kısa Süreli Akım (1s)	Icw	kA	3.77	6
Beyan Tepe Dayanma Akımı	Ipk	kA	5.44	9.18
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	2.22	3.6
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	3.15	5.29
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	2.22	3.6
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	3.15	5.29

TEKNİK TABLO & TECHNICAL TABLE (SP-H CU)				
BAKIR İLETKEN (CU)				
Beyan Akımı	In	A	100	160
Busbar Kodu			SP-HC11	SP-HC17
Koruma Sınıfı	IP55			
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1			
Maks. Beyan Çalışma Gerilimi	Ue	Vac	690	
Beyan Darbe Dayanım Gerilimi	Uimp	kV	8	
Beyan Frekansı	f	Hz	50	
Beyan Yalıtım Gelirimi	Ui	V	1000	Kategori IV
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK10			
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS-HD 60364-4-41, madde A1)			
Beyan Kısa Süreli Akım (1s)	Icw	kA	3.7	6.5
Beyan Tepe Dayanma Akımı	Ipk	kA	5.3	10.3
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	2.2	3.7
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	3.25	5.5
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	2.2	3.7
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	3.25	5.5

Standart Boy

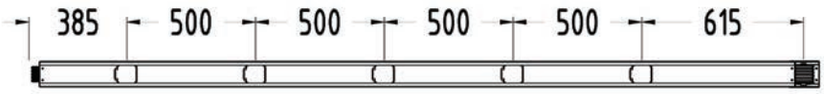


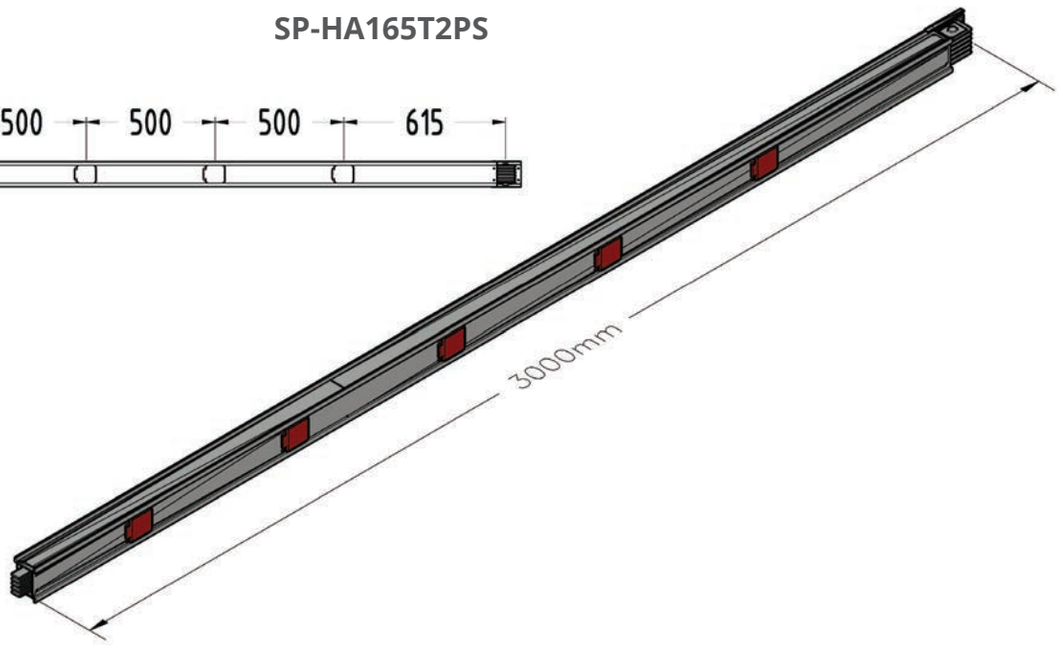
Plug-In Busbar	PS

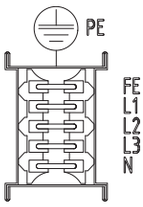
ÖRNEK SİPARİŞ

160 A Alüminyum,
Plug-in IP 55 5 İletken

SP-HA165T2PS





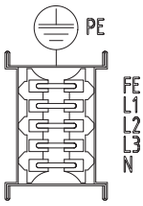


Feeder Busbar	FS

ÖRNEK SİPARİŞ

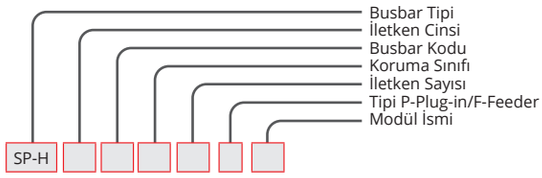
100 A Alüminyum,
Feeder IP 55 5 İletken

SP-HA105T2FS



SP-H

Ara Boy

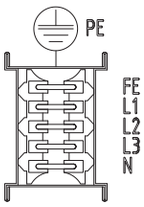


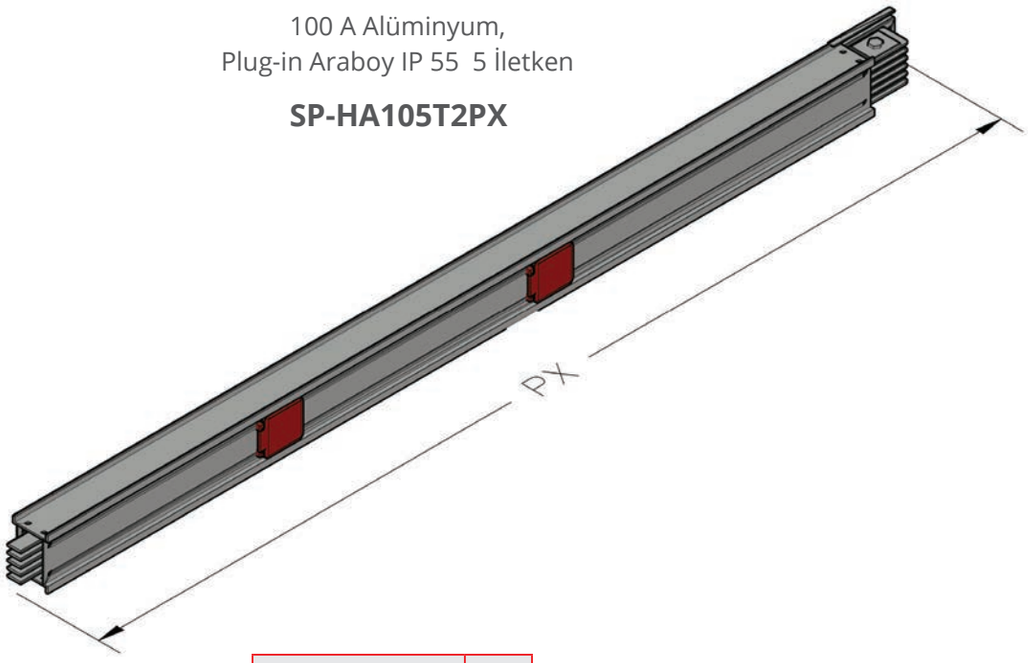
Plug-in Busbar Araboy	PX

ÖRNEK SİPARİŞ

100 A Alüminyum,
Plug-in Araboy IP 55 5 İletken

SP-HA105T2PX



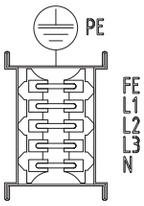


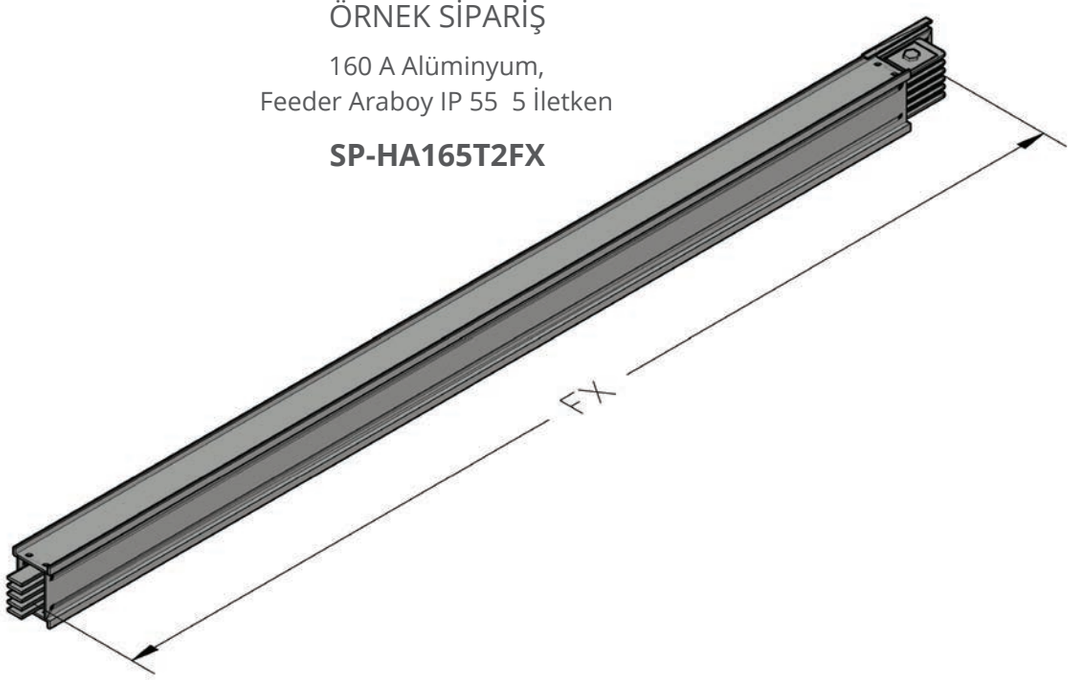
Feeder Busbar Araboy	FX

ÖRNEK SİPARİŞ

160 A Alüminyum,
Feeder Araboy IP 55 5 İletken

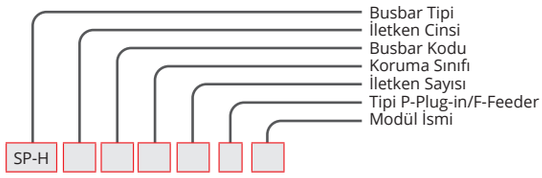
SP-HA165T2FX





SP-H

Dönüş Modülleri

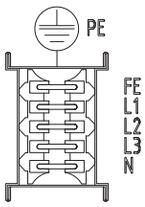


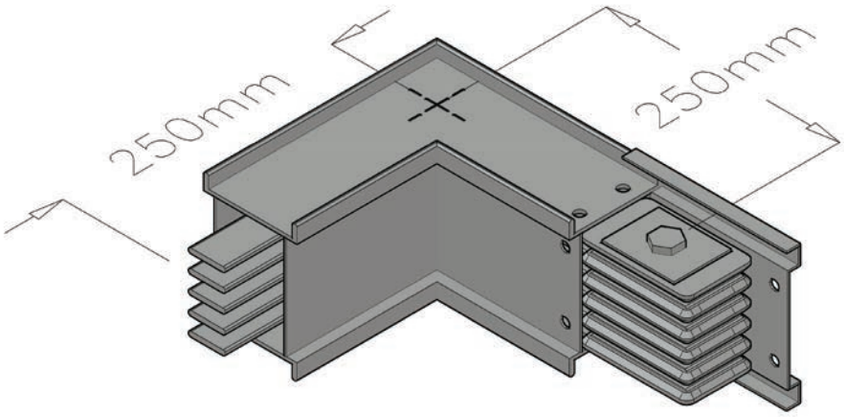
Yatay Dirsek Modülü	YD

ÖRNEK SİPARİŞ

100 A Alüminyum,
Yatay Dirsek IP 55 5 İletken

SP-HA105T2YD



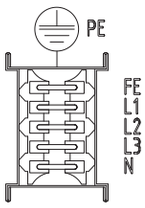


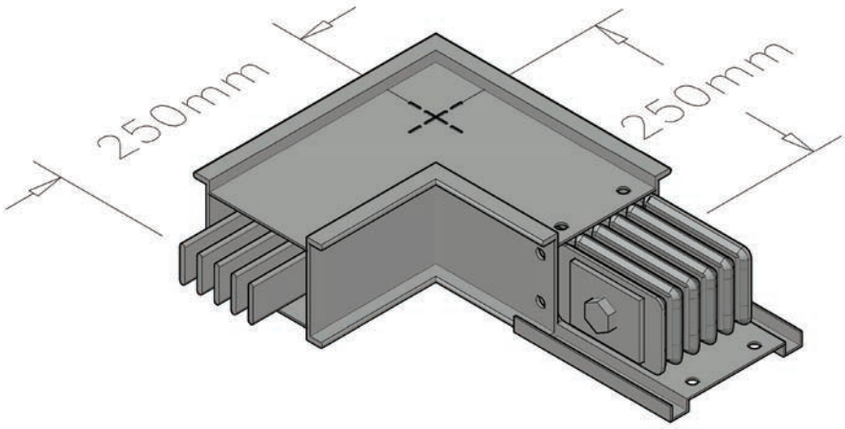
Dikey Dirsek Modülü	DD

ÖRNEK SİPARİŞ

160 A Alüminyum,
Dikey Dirsek IP 55 5 İletken

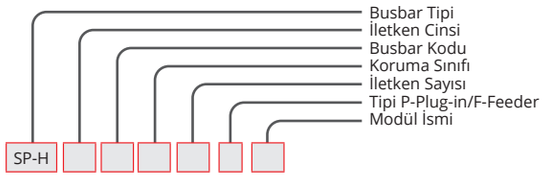
SP-HA165T2DD





SP-H

Dilatasyon Modülü

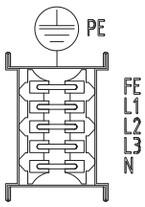


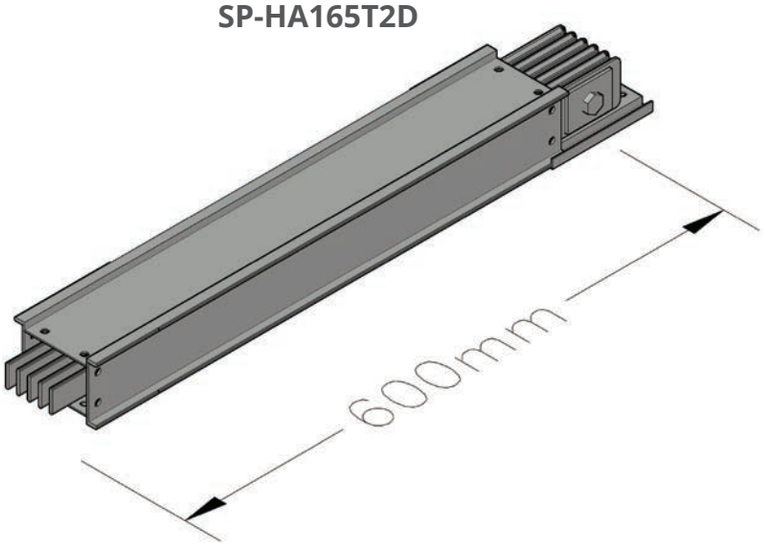
Dilatasyon Modülü	D

ÖRNEK SİPARİŞ

160 A Alüminyum,
Dilatasyon IP 55 5 İletken

SP-HA165T2D



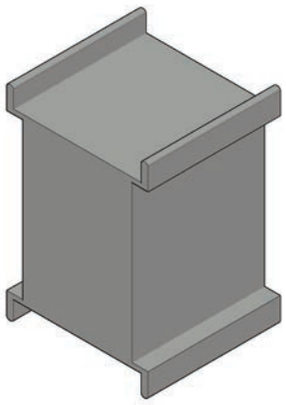


Sonlandırma Modülü	S

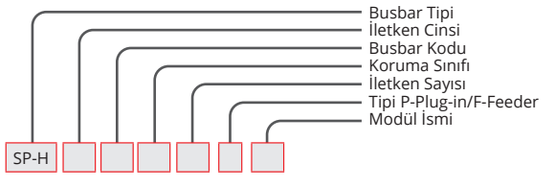
ÖRNEK SİPARİŞ

100 A Alüminyum,
Sonlandırma IP 55 5 İletken

SP-HA105T2S



Çıkış Kutusu Plastik



STANDART ÇIKIŞ KUTULARI (BOŞ) 16A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
16	4	L1,L2,L3,N,PE (GÖVDE)	SPHA1654B1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA1655B2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA1655B3

STANDART ÇIKIŞ KUTULARI (BOŞ) 32A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
32	4	L1,L2,L3,N,PE (GÖVDE)	SPHA3254B1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA3255B2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA3255B3

STANDART ÇIKIŞ KUTULARI (BOŞ) 40A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
40	4	L1,L2,L3,N,PE (GÖVDE)	SPHA4054B1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA4055B2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA4055B3

STANDART ÇIKIŞ KUTULARI (BOŞ) 63A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
63	4	L1,L2,L3,N,PE (GÖVDE)	SPHA6354B1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA6355B2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA6355B3

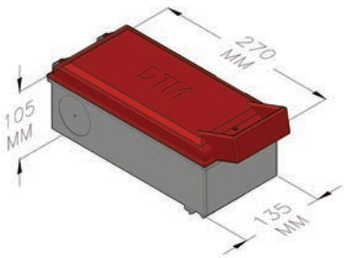
STANDART ÇIKIŞ KUTULARI (BOŞ) 80A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
80	4	L1,L2,L3,N,PE (GÖVDE)	SPHA8054B1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA8055B2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA8055B3

Çıkış Kutusu

ÖRNEK SİPARİŞ

16 A Alüminyum,
Çıkış Kutusu Boş IP 55 5 İletken

SPHA1655B2



ŞALTER TİPİ KOD	
ŞALTERLİ	BOŞ
M	B

STANDART ÇIKIŞ KUTULARI (MCB) 16A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
16	4	L1,L2,L3,N,PE (GÖVDE)	SPHA1654M1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA1655M2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA1655M3

STANDART ÇIKIŞ KUTULARI (MCB) 32A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
32	4	L1,L2,L3,N,PE (GÖVDE)	SPHA3254M1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA3255M2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA3255M3

STANDART ÇIKIŞ KUTULARI (MCB) 40A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
40	4	L1,L2,L3,N,PE (GÖVDE)	SPHA4054M1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA4055M2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA4055M3

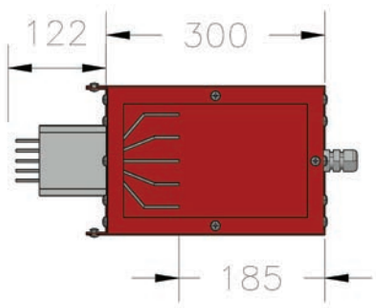
STANDART ÇIKIŞ KUTULARI (MCB) 63A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
63	4	L1,L2,L3,N,PE (GÖVDE)	SPHA6354M1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA6355M2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA6355M3

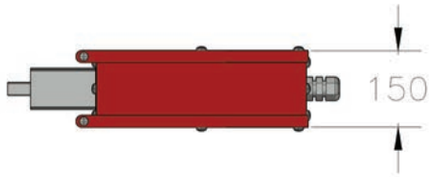
STANDART ÇIKIŞ KUTULARI (MCB) 80A			
AKIM	İLETKEN	KONFİGÜRASYON	KOD
80	4	L1,L2,L3,N,PE (GÖVDE)	SPHA8054M1
	5	L1,L2,L3,N,PE +(GÖVDE)	SPHA8055M2
	5	L1,L2,L3,N,CPE,PE (GÖVDE)	SPHA8055M3

SP-H

Besleme Modülü

Baştan Besleme Modülü	BM

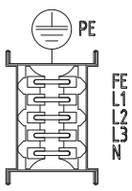


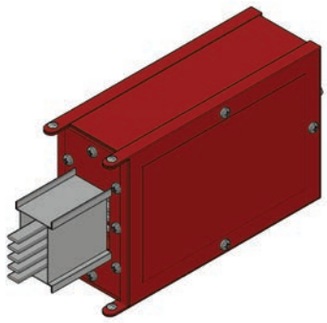


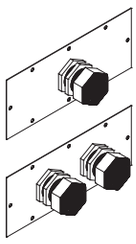
ÖRNEK SİPARİŞ

160 A Alüminyum,
Besleme Modülü IP 55 5 İletken

SP-HA165T2BM



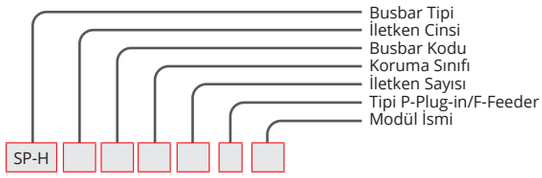


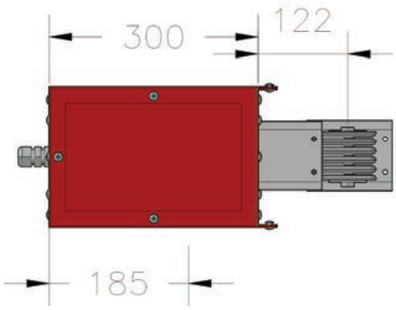


REKOR PLAKALARI		
AMR.	RAKOR TİPİ	KOD
100	PG21	BR1
160	PG36	BR2

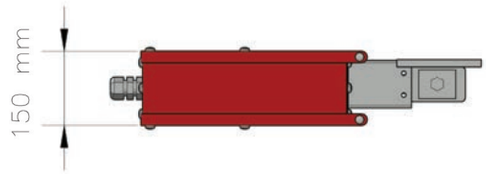
ŞALTER TİPİ KOD	
ŞALTERLİ	BOŞ
M	B

Besleme Modülleri





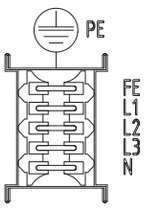
Sondan Besleme Modülü	SM

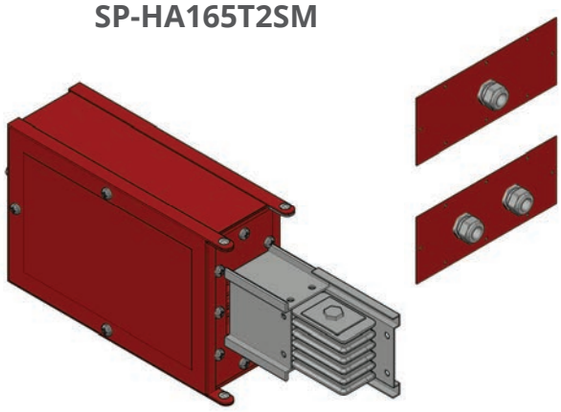


ÖRNEK SİPARİŞ

160 A Alüminyum,
Besleme Modülü IP 55 5 İletken

SP-HA165T2SM





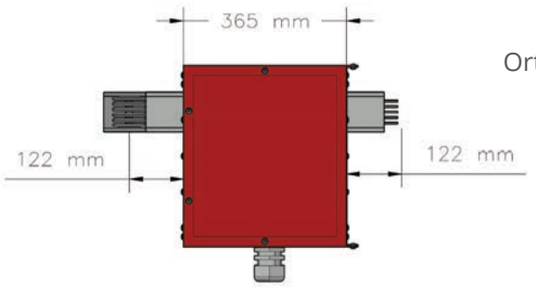
REKOR PLAKALARI		
AMR.	RAKOR TİPİ	KOD
100	PG21	SR1
160	PG36	SR2

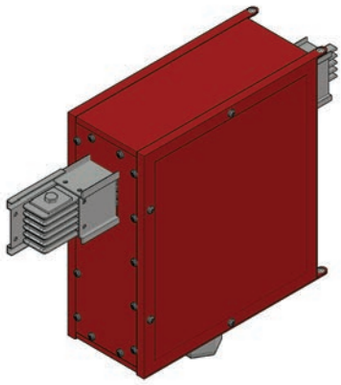
Ortadan Besleme Modülü SOL	BL

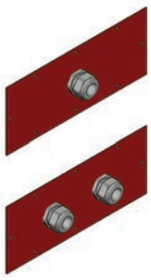
ÖRNEK SİPARİŞ

100 A Alüminyum,
Ortandan Besleme IP 55 5 İletken

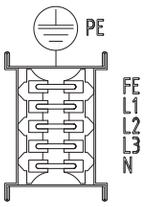
SP-HA105T2BL





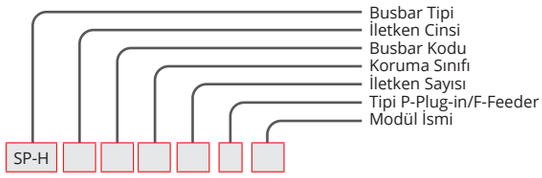


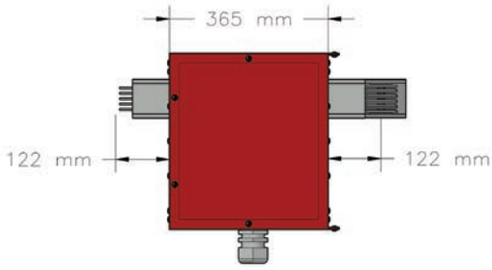
REKOR PLAKALARI		
AMR.	RAKOR TİPİ	KOD
100	PG21	OR1
160	PG36	OR2



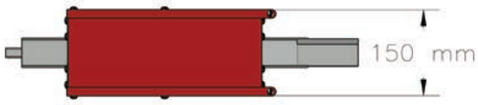
SP-H

Besleme Modülleri





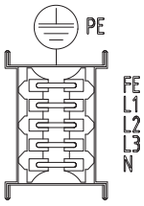
Ortadan Besleme Modülü SAĞ	BR

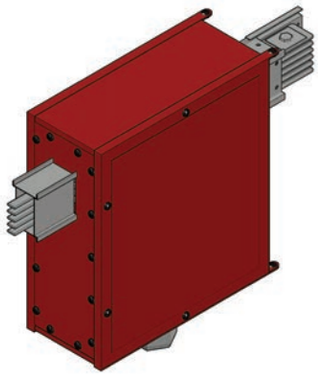


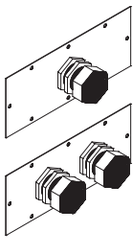
ÖRNEK SİPARİŞ

160 A Alüminyum,
Ortadan Besleme IP 55 5 İletken

SP-HA165T2BR







REKOR PLAKALARI		
AMR.	RAKOR TİPİ	KOD
100	PG21	BR1
160	PG36	BR2

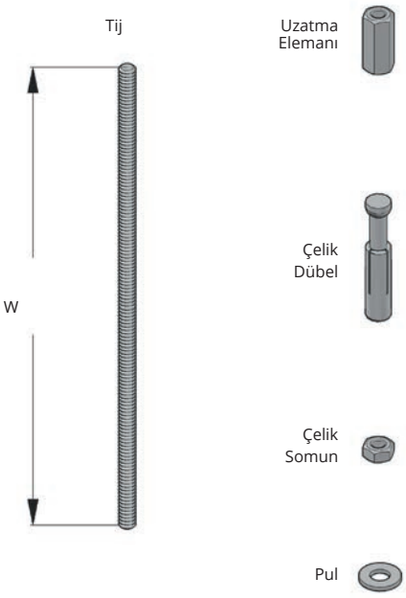
SP-H

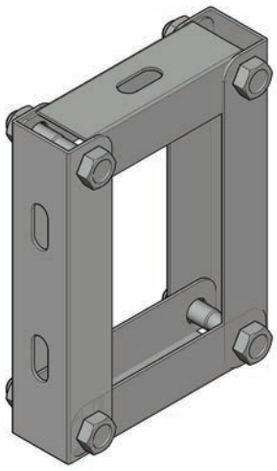
Askı Elemanı	A

ÖRNEK SİPARİŞ

100 A Alüminyum,
Askı Takımı IP 55 5 İletken

SP-HA105T2A



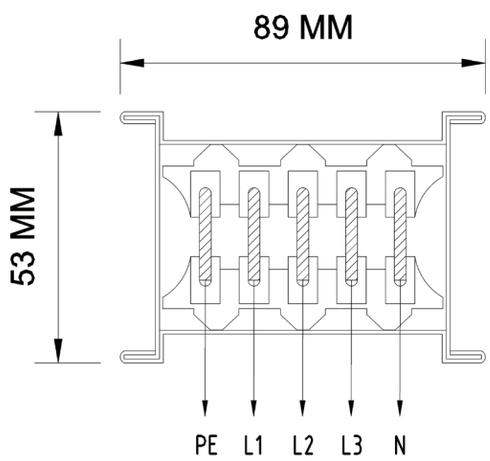


BAĞLANTI ELEMANLARI		
Açıklama	W (mm)	Kodu
B-E 8 Tij Askı (M8)	500	T101
B-E 8 Tij Askı (M8)	1000	T102
(M8) Uzatma Elemanı	-	T103
M 8 Çekmeli Dübel	-	T104
M 8 Çelik Somun	-	T105

Busbar Teknik Bilgiler

ALÜMİNYUM BUSBAR EBAT VE AĞIRLIKLARI								
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT MM			FEEDER KG+MT	
							3P+N+PE (4)	3P+N+PE+FE1 (5)
100A	53	X	89	3	X	16	2,05	2,2
160A	62		89			25	2,4	2,6

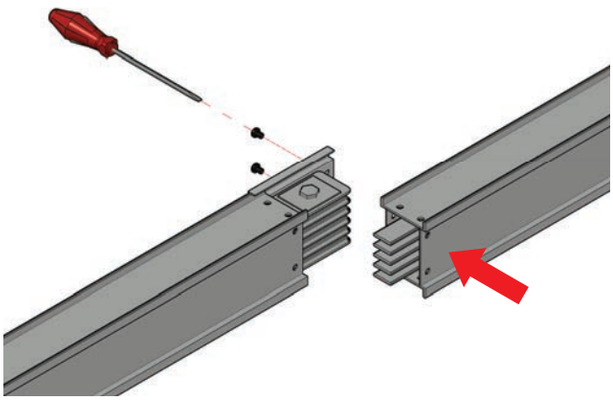
BAKIR BUSBAR EBAT VE AĞIRLIKLARI								
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT MM			FEEDER KG+MT	
							3P+N+PE (4)	3P+N+PE+FE1 (5)
100A	53	X	89	3	X	10	2,45	3
160A	62		89			16	3	3,4



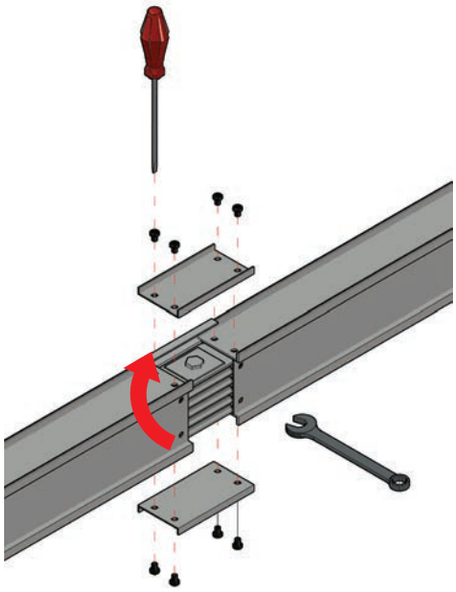
ELEKTRİKSEL TEKNİK VERİLER			
Akım Değeri	Direnç R (mohm/m)	Reaktans X (mohm/m)	Empedans Z (mohm/m)
Alüminyum			
100	0,99	0,23	1,01
160	0,64	0,63	0,90
Bakır			
100	0,96	0,21	0,98
160	0,55	0,17	0,58

Gerilim düşümü ΔV% hesabı aşağıdaki formüle göre yapınız.	
ΔV% = √3 x (R x cosφ + X x sinφ) x Ib x L / Ue x 100	
R: Direnç (mohm/m) (Elektriksel teknik veriler tablosundan bulunur)	
X: Reaktans (mohm/m) (Elektriksel teknik veriler tablosundan bulunur)	
I_b: Tüm ekstra etkili yüklerin toplamı	
L: Busbar hattının toplam uzunluğu	
U_e: Besleme gerilimi	
Örnek: 100 A Busbara ait hesaplama aşağıdaki gibidir.	
(L) Hat uzunluğu	100 mt
(I_b) Etkili yük	65 A
U_e : Besleme gerilimi	400 V
Cos φ	0,80
R değeri tablodan 0,99 x 10^{-3} ohm/m ve X değeri tablodan 0,23 x 10^{-3} ohm/m	
(ΔV) Maksimum izin verilen gerilim düşümü 3%	
ΔV% = √3 x (R x cosφ + X x sinφ) x Ib x L / Ue x 100	
$\Delta V\% = \frac{1{,}73 \times (0{,}99 \times 0{,}8 + 0{,}23 \times 0{,}6) \times 10\text{-}3 \times 65 \times 100 \times 100}{400} = 2{,}62\%$	
Bulunan değer %3 'ten küçüktür. 100 A Busbar seçimi gerilim düşümü hesabına göre uygundur.	

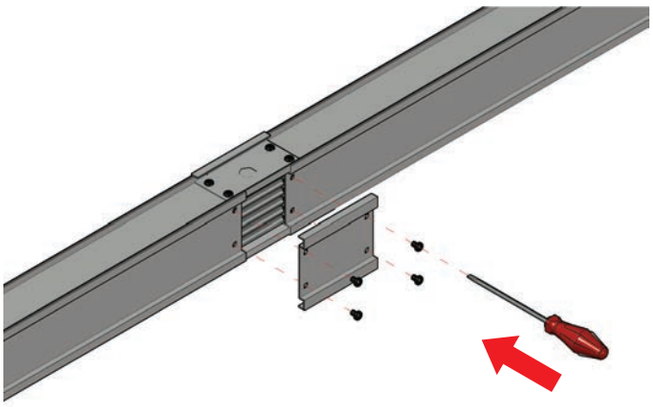
Montaj Şekli



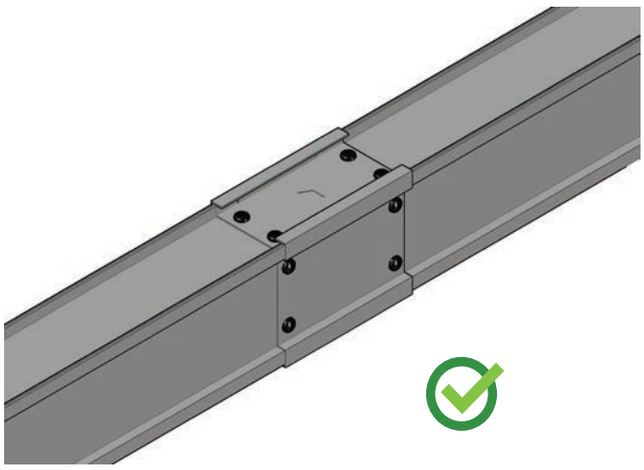
1 Ek kapak gövdeye oturacak şekilde busbar'a montaj ediniz.



2 Ek blok busbar'a montaj ediniz ve diğer gövdeye sabitleyiniz.



3 Ek kapağını kapatmadan izolatörlerin çatlak veya kırık olup olmadığına kontrol ederek ek kapağını montaj ediniz.



4 Ek blok tork ile sıkma değeri 20Nm dir.

MP-H SERİSİ 160A-600A

Genel Özellikler 40
Proje Bilgileri 42
Aksesuarlar
Standart Boy 44
Dönüş Modülleri 45
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Dikey ve Yatay Busbar Uygulamaları 59
Yatay Dilatasyon Modül Uygulamaları 60
Montaj Bilgileri
Montaj Şekli 61

GENEL ÖZELLİKLER

MP-H Busbar kanal sistemleri alçak gerilim enerji dağıtım hatlarında iletkenleri havalı tipte olan sistemlerdir. Plug-in üretim standart olarak dört çıkışlı olarak üretilir. 160A- 600A e kadar Alüminyum veya bakır iletkenli olarak üretilir. 5 kutuplu tam nötr konfigürasyonda işletme gerilimi 1000 V'tur. Kasa galvenizli sac olarak IP 55 koruma sınıfında üretilir.

Kullanım Yerleri

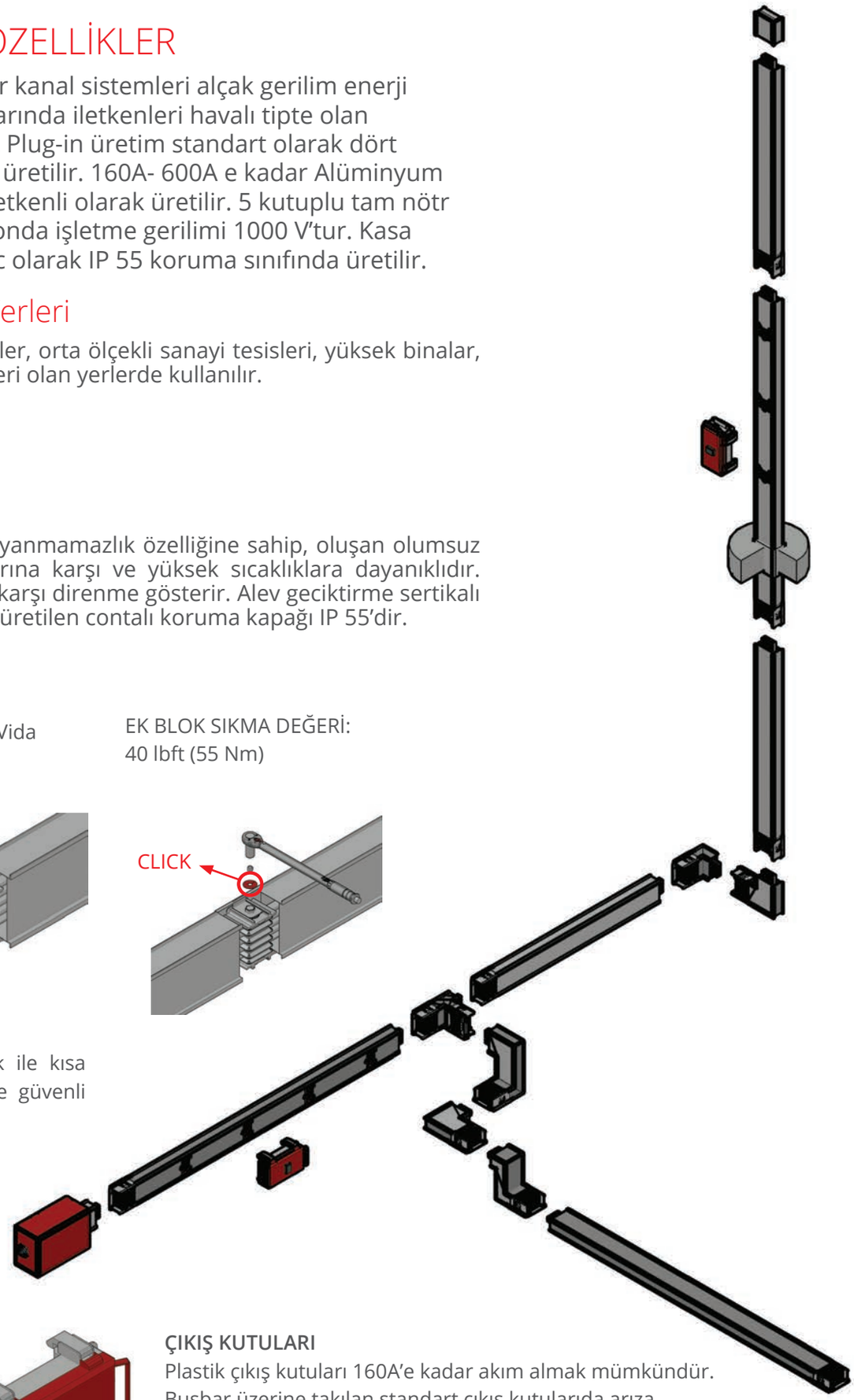
Ticari merkezler, orta ölçekli sanayi tesisleri, yüksek binalar, data merkezleri olan yerlerde kullanılır.

Boyama

RAL 7038

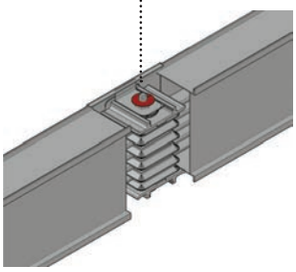
Koruma

Plug-inler V2 yanmamazlık özelliğine sahip, oluşan olumsuz çevre koşullarına karşı ve yüksek sıcaklıklara dayanıklıdır. Ağır darbeye karşı direnme gösterir. Alev geciktirme sertikalı malzemeden üretilen contalı koruma kapağı IP 55'dir.



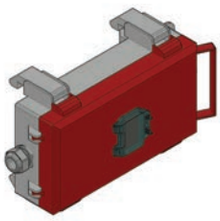
MP-H

Çift Kafalı Vida



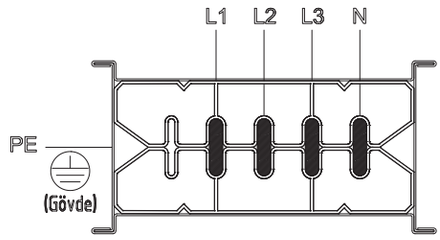
EK BLOK SIKMA DEĞERİ:
40 lbft (55 Nm)

EK BLOK
Tek civatalı ek ile kısa sürede hızlı ve güvenli montaj yapılır.



ÇIKIŞ KUTULARI
Plastik çıkış kutuları 160A'e kadar akım almak mümkündür. Busbar üzerine takılan standart çıkış kutularıda arıza anında busbar dan sökülmeden enerjiyi kesmek için çıkış kutusunun kapağının açılması yeterli olacaktır.

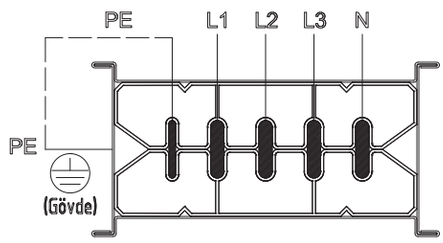
3P+N+PE (4 İLETKEN) T1



GALVENİZLİ SAC GÖVDE

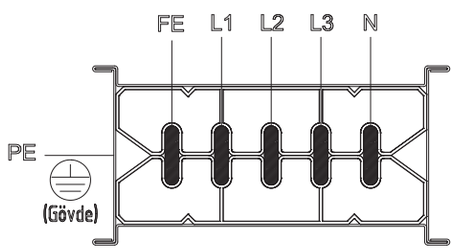
Nötr iletken kesiti faz iletkeni ile aynıdır. Topraklama iletken kesiti aynı olarak kasa içerisine konulur.

3P+N+PE+PE (4,5 İLETKEN) T3



GALVENİZLİ SAC GÖVDE

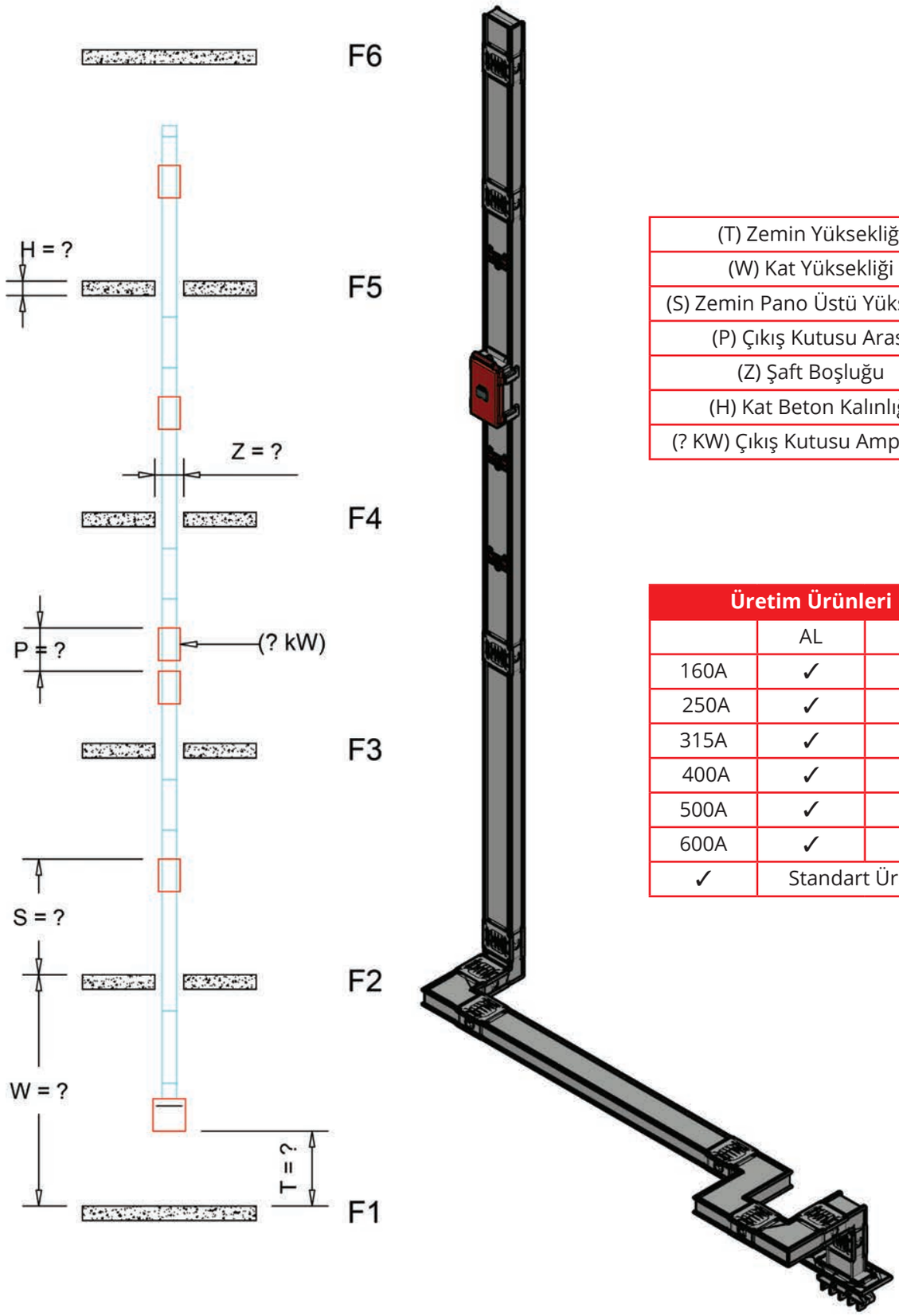
3P+N+PE+FE2 (5 İLETKEN) T2



GALVENİZLİ SAC GÖVDE

Nötr iletken kesiti faz iletkeni ile aynı topraklama için kullanılan iletken kesiti faz iletkenin kesitinin yarısıdır.

DİKEY DAĞITIM PROJESİ



(T) Zemin Yüksekliği
(W) Kat Yüksekliği
(S) Zemin Pano Üstü Yüksekliği
(P) Çıkış Kutusu Arası
(Z) Şaft Boşluğu
(H) Kat Beton Kalınlığı
(? KW) Çıkış Kutusu Amperleri

Üretim Ürünleri		
	AL	CU
160A	✓	-
250A	✓	✓
315A	✓	✓
400A	✓	✓
500A	✓	-
600A	✓	✓
✓	Standart Üretim	

MP-H

SİPARİŞ KOD SİSTEMİ

MP-H	A	25	5	T2	F	YDR

- Busbar Tipi
- İletken Cinsi
- Busbar Kodu
- Koruma Sınıfı
- İletken Sayısı
- Tipi P-Plug-in/F-Feeder
- Modül İsmi

Busbar Tipi

BUSBAR ADI

İletken Cinsi

ALÜMİNYUM (AL)	(A)
BAKIR (CU)	(C)

Busbar Akımı

MP-H AL		MP-H CU	
AKIM	BUSBAR KODU	AKIM	BUSBAR KODU
160	16	250	26
250	25	315	32
315	31	400	41
400	40	600	61
500	50		
600	60		

Koruma Sınıfı

IP55	5

İletkin Sayısı

İLETKEN SAYISI	KODU	L1	L2	L3	N	1/2 TOPRAK	TEMİZ TOPRAK	1/2 TEMİZ TOPRAK	TOPRAK (GÖVDE)
3P+N+PE (4P)	T1	✓	✓	✓	✓				✓
3P+N+PE+FE1 (5P)	T2	✓	✓	✓	✓	✓	✓		✓

Tipi
Busbar Kullanım Amacı ile İlgili Bilgiler.

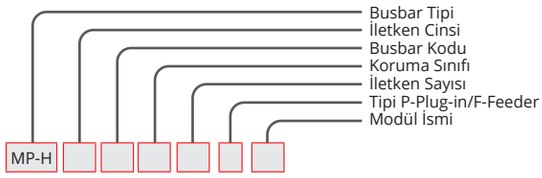
Tipi P-Plug-in / F-Feeder

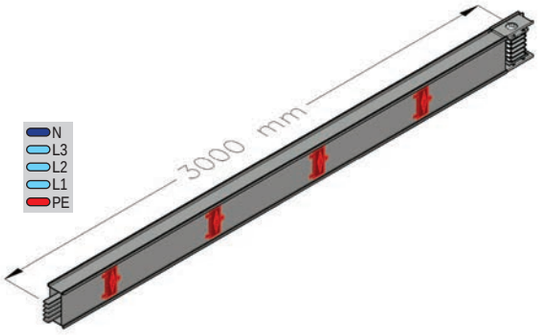
(P) PLUG-IN DÜZ BOYLARDA PLUG-IN YERLERİNDEN AKIM ALINMASINDA KULLANILIR.
(F) FEEDER EK NOKTALARINDAN AKIM ALINMASI GEREKEN VE DİREK BESLEME YAPILAN YERLERDE KULLANILIR.

Modül İsmi

Feeder Busbar	FS
Plug-In Busbar	PS
Yatay Dirsek Sağa	YDR
Yatay Dirsek Sola	YDL
Dikey Dirsek Aşağı	DDD
Dikey Dirsek Yukarı	DDU
Feeder Ara Boy	FX
Plug-In Ara Boy	PX
Çift Dikey Dirsek (Off-Set) Yukarı	DOU
Çift Dikey Dirsek (Off-Set) Aşağı	DOD
Çift Dikey Dirsek (Off-Set) Sol	YOL
Çift Dikey Dirsek (Off-Set) Sağ	YOR
Yukarı Sola (Kombine Off-Set)	ULK
Yukarı Sağa (Kombine Off-Set)	URK
Aşağı Sola (Kombine Off-Set)	DLK
Aşağı Sağa (Kombine Off-Set)	DRK
Sola Yukarı (Kombine Off-Set)	LUK
Sağa Yukarı (Kombine Off-Set)	RUK
Sola Aşağı (Kombine Off-Set)	LDK
Sağa Aşağı (Kombine Off-Set)	RDK
Ortadan (T) Modülü	OT
Dörtlü (T) Modülü	DT
Rediksiyon	RD
Genleşme Modülü	G
Pano Bağlantı Modülü (E)	PME
Pano Bağlantı Modülü (D)	PMD
Çıkış Kutusu (Plug-in) Yükkesicili	KM1
Çıkış Kutusu Plastik (Boş)	KPO
Çıkış Kutusu (Plug-in) Şalterli	KM2
Sondan Besleme Modülü	BM1
Baştan Besleme Modülü	BM2
Ortadan Besleme Modülü	OB1
Sonlandırma Modülü	S
Dilatasyon (Yatay)	DH
Yatay Askı Dikey Modülü (U Profil)	YVU
Yatay Askı Yatay Modülü (U Profil)	YHU
Yatay Askı Dikey Modülü	YVK
(40x40 Köşebent)	YVK
Yatay Askı Yatay Modülü	SA
(40x40 Köşebent)	YHK
Şaft Askı Modülü	SA
Ortadan Besleme Modülü	OB2

Standart Boy





Plug-in Busbar	PS

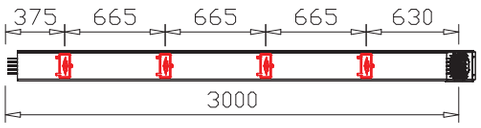
ÖRNEK SİPARİŞ

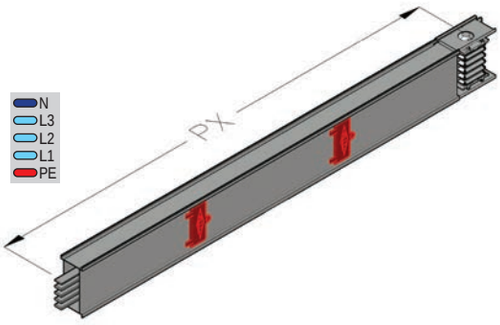
250 A Alüminyum,
Plug-in IP 55 5 İletken

MP-HA255T2PS

PLUG-IN BUSBAR

Plug-in Boylarda standart üretim 4 çıkışlıdır. İstek üzerine çıkış sayısı değiştirilebilir.



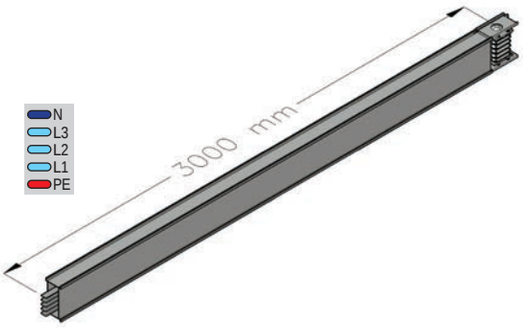


Plug-in Ara Boy	PX

ÖRNEK SİPARİŞ

400 A Alüminyum,
Plug-in IP 55 5 İletken

MP-HA405T2PX



Feeder Busbar	FS

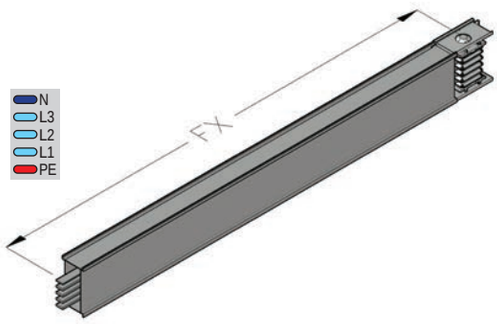
ÖRNEK SİPARİŞ

400 A Alüminyum,
Feeder IP 55 5 İletken

MP-HA405T2FS

FEEDER BUSBAR

Güç iletiminde direk beslemeyi sağlar. Standart üretim 3000 mm, istek üzerine minimum 500 mm den başlayan farklı ölçülerde imal edilebilir.



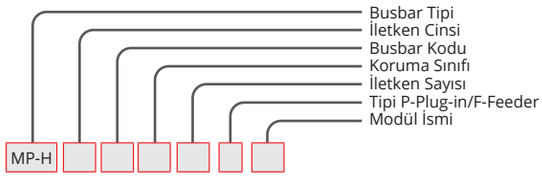
Feeder Ara Boy	FX

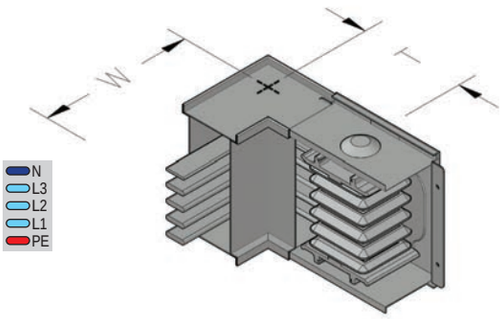
ÖRNEK SİPARİŞ

400 A Alüminyum,
Dirsek IP 55 5 İletken

MP-HA405T2FX

Dönüş Modülleri



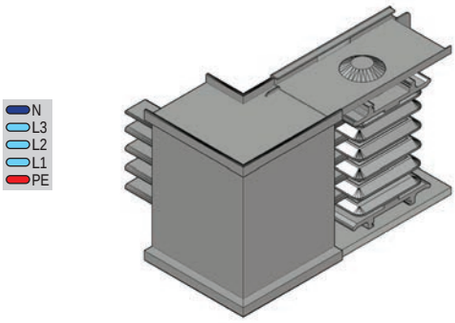


Yatay Dirsek Sağa	YDR

ÖRNEK SİPARİŞ

400 A Alüminyum,
Dirsek IP 55 5 İletken

MP-HA405T2FYDR

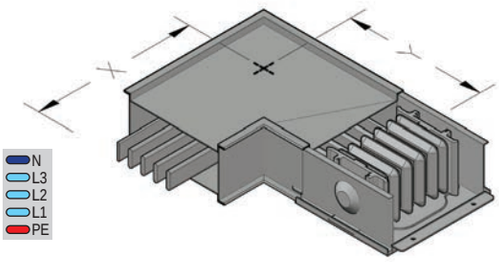


Yatay Dirsek Sola	YDL

ÖRNEK SİPARİŞ

400 A Alüminyum,
Dirsek IP 55 5 İletken

MP-HA405T2FYDL

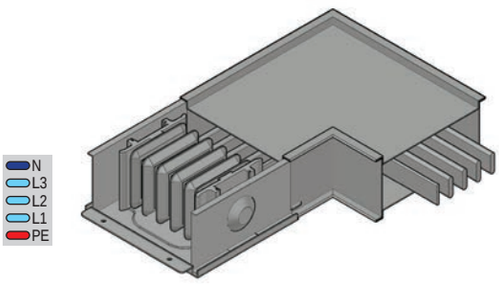


Dikey Dirsek Aşağı	DDD

ÖRNEK SİPARİŞ

400 A Alüminyum,
Dirsek IP 55 5 İletken

MP-HA405T2FDDD



Dikey Dirsek Yukarı	DDU

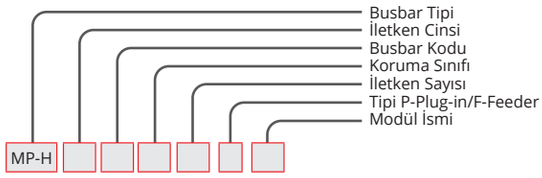
ÖRNEK SİPARİŞ

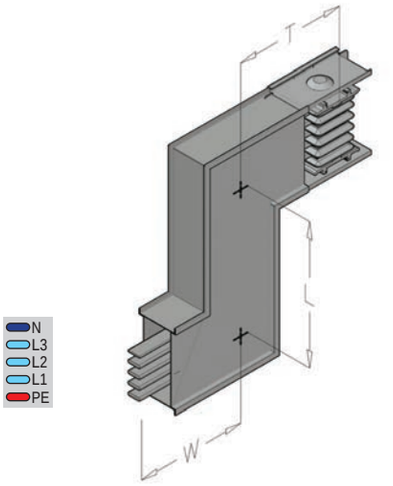
400 A Alüminyum,
Dirsek IP 55 5 İletken

MP-HA405T2FDDU

(AL)			(CU)		
AMR.	W mm	T mm	AMR.	W mm	T mm
160A	145	145	250A	150	150
250A	150	150	315A	155	155
315A	155	155	400A	165	165
400A	165	165	600A	180	180
500A	170	170			
600A	180	180			
AMP.	X mm	Y mm	AMP.	X mm	Y mm
160A	240	240	250A	240	240
250A	240	240	315A	240	240
315A	240	240	400A	240	240
400A	240	240	600A	240	240
500A	240	240			
600A	240	240			

Dönüş Modülleri





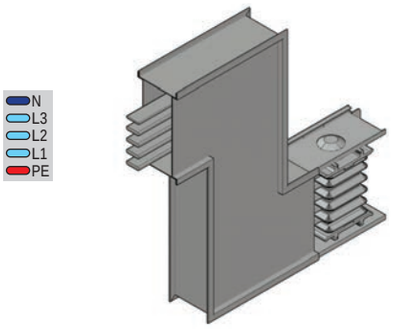
Çift Dikey Dirsek Yukarı Off-set	DOU

ÖRNEK SİPARİŞ

250 A Bakır

Ofset IP 55 5 İletken

MP-HC265T2FDOU



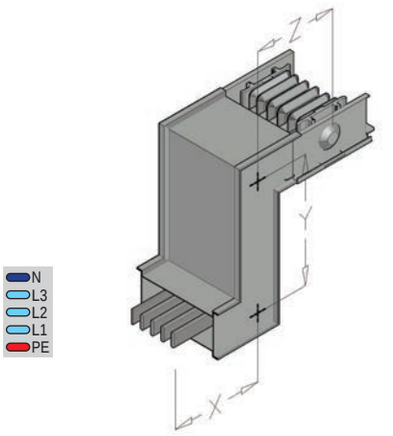
Çift Dikey Dirsek Aşağı Off-set	DOD

ÖRNEK SİPARİŞ

400 A Bakır

Ofset IP 55 5 İletken

MP-HC415T2FDOD



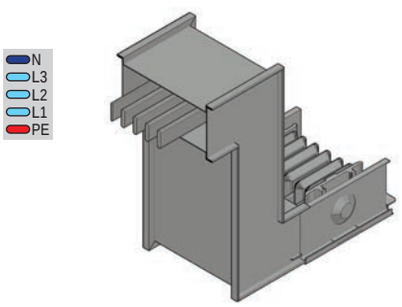
Çift Yatay Dirsek Sağa Off-set	YOR

ÖRNEK SİPARİŞ

600 A Bakır

Ofset IP 55 5 İletken

MP-HC615T2FYOR



Çift Yatay Dirsek Sola Off-set	YOL

ÖRNEK SİPARİŞ

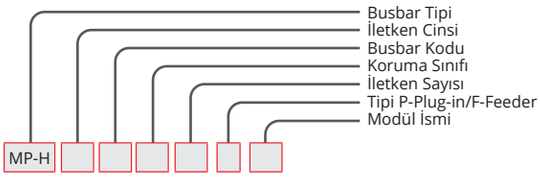
250 A Bakır

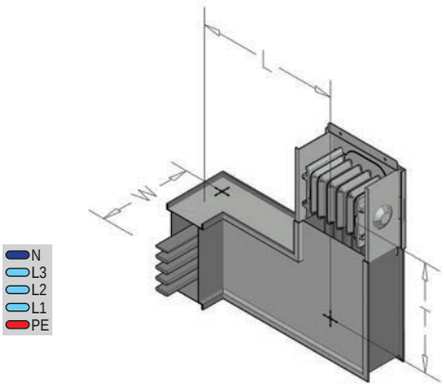
Ofset IP 55 5 İletken

MP-HC265T2FYOL

(AL)				(CU)			
AMR.	W mm	T mm	L mm	AMR.	W mm	T mm	L mm
160A	240	240	240	250A	240	240	240
250A	240	240	240	315A	240	240	240
315A	240	240	240	400A	240	240	240
400A	240	240	240	600A	240	240	240
500A	240	240	240				
600A	240	240	240				
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
160A	145	145	145	250A	150	150	150
250A	150	150	150	315A	155	155	155
315A	155	155	155	400A	165	165	165
400A	165	165	165	600A	180	180	180
500A	170	170	170				
600A	180	180	180				

Dönüş Modülleri





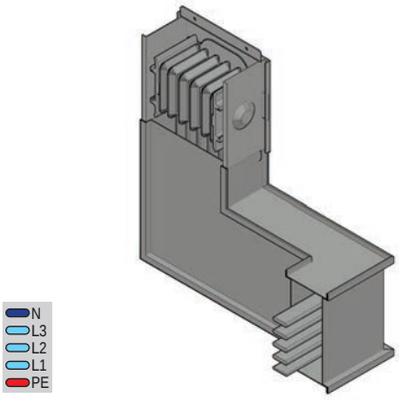
Yukarı Sağa Kombine Off-set	URK

ÖRNEK SİPARİŞ

600 A Bakır

Ofset IP 55 5 İletken

MP-HC615T2FURK



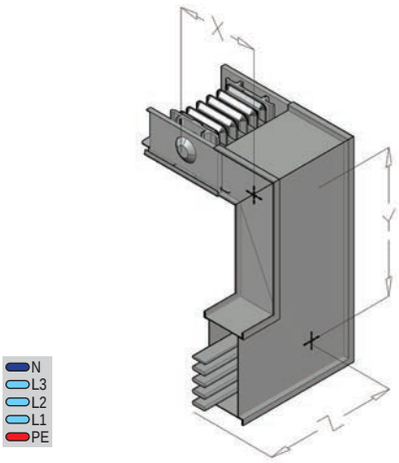
Yukarı Sola Kombine Off-set	ULK

ÖRNEK SİPARİŞ

400 A Alüminyum

Ofset IP 55 5 İletken

MP-HA405T2FULK



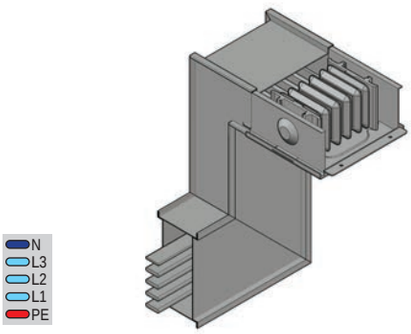
Aşağı Sağa Kombine Off-set	DRK

ÖRNEK SİPARİŞ

250 A Bakır

Ofset IP 55 5 İletken

MP-HC265T2FDRK



Aşağı Sola Kombine Off-set	DLK

ÖRNEK SİPARİŞ

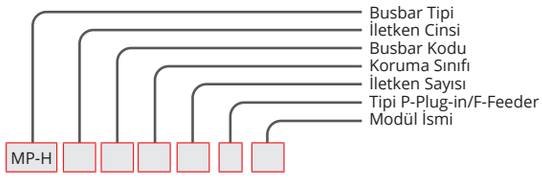
400 A Alüminyum

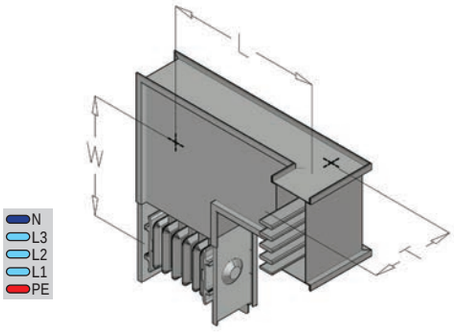
Ofset IP 55 5 İletken

MP-HA405T2FDLK

(AL)				(CU)			
AMR.	W mm	T mm	L mm	AMR.	W mm	T mm	L mm
160A	145	240	240	250A	150	240	240
250A	150	240	240	315A	155	240	240
315A	155	240	240	400A	165	240	240
400A	165	240	240	600A	180	240	240
500A	170	240	240				
600A	180	240	240				
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
160A	145	240	240	250A	150	240	240
250A	150	240	240	315A	155	240	240
315A	155	240	240	400A	165	240	240
400A	165	240	240	600A	180	240	240
500A	170	240	240				
600A	180	240	240				

Dönüş Modülleri





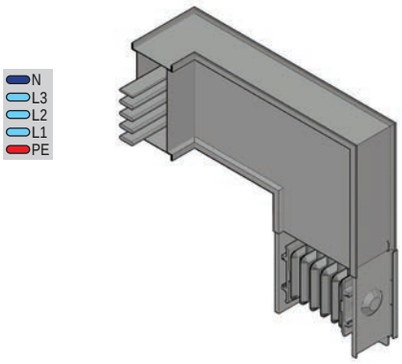
Sağa Yukarı Kombine Off-set	RUK

ÖRNEK SİPARİŞ

250 A Bakır

Kombine Off-set IP 55 5 İletken

MP-HC265T2FRUK



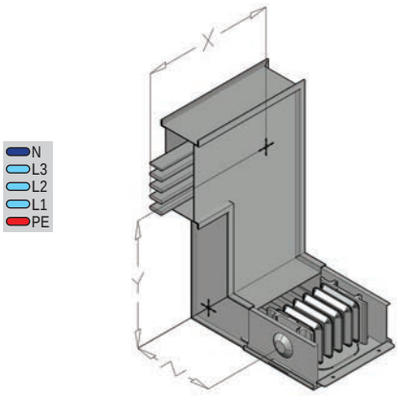
Sola Yukarı Kombine Off-set	LUK

ÖRNEK SİPARİŞ

250 A Bakır

Kombine Off-set IP 55 5 İletken

MP-HC265T2FLUK



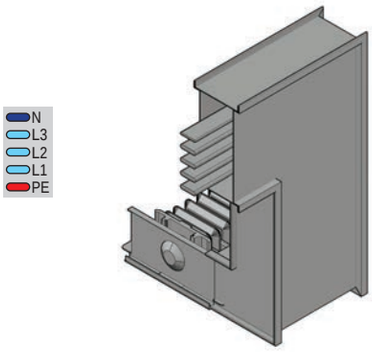
Sağa Aşağı Kombine Off-set	RDK

ÖRNEK SİPARİŞ

250 A Alüminyum

Kombine Off-set IP 55 5 İletken

MP-HA255T2FRDK



Sola Aşağı Kombine Off-set	LDK

ÖRNEK SİPARİŞ

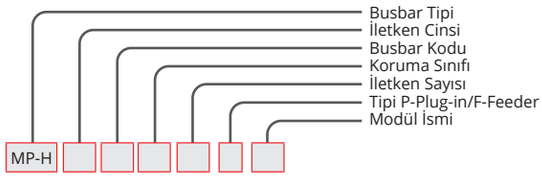
250 A Alüminyum

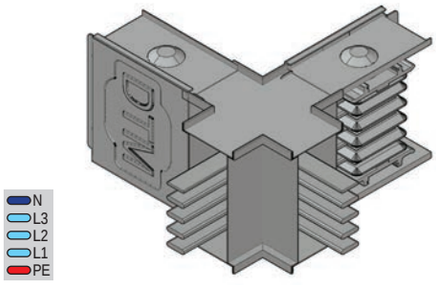
Kombine Off-set IP 55 5 İletken

MP-HA255T2FLDK

(AL)				(CU)			
AMR.	W mm	T mm	L mm	AMR.	W mm	T mm	L mm
160A	240	145	240	250A	240	150	240
250A	240	150	240	315A	240	155	240
315A	240	155	240	400A	240	165	240
400A	240	165	240	600A	240	180	240
500A	240	170	240				
600A	240	180	240				
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
160A	240	240	145	250A	240	240	150
250A	240	240	150	315A	240	240	155
315A	240	240	155	400A	240	240	165
400A	240	240	165	600A	240	240	180
500A	240	240	170				
600A	240	240	180				

Dönüş Modülleri



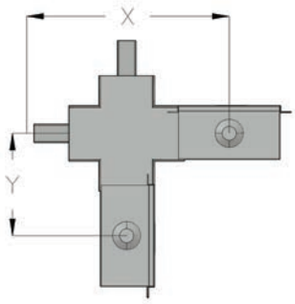


Dörtlü (T) Modülü	DT

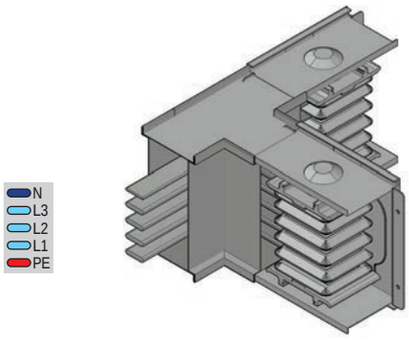
ÖRNEK SİPARİŞ

250 A Alüminyum,
Dörtlü T Modül IP 55 5 İletken

MP-HA255T2FDT



(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
160A	290	145	250A	300	150
250A	300	150	315A	310	155
315A	310	155	400A	330	165
400A	330	165	600A	360	180
500A	340	170			
600A	360	180			
AMR.	W mm	T mm	AMR.	W mm	T mm
160A	145	145	250A	150	150
250A	150	150	315A	155	155
315A	155	155	400A	165	165
400A	165	165	600A	180	180
500A	170	170			
600A	180	180			

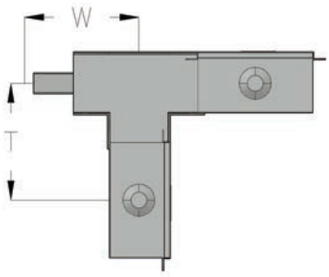


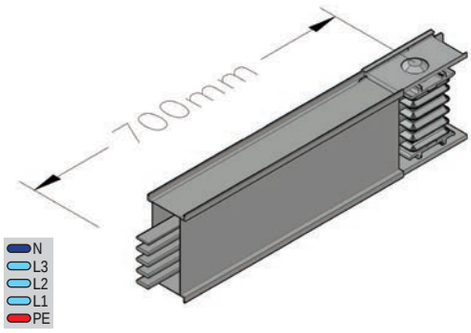
Ortadan (T) Modülü	OT

ÖRNEK SİPARİŞ

250 A Alüminyum,
T Modül IP 55 5 İletken

MP-HA255T2FOT





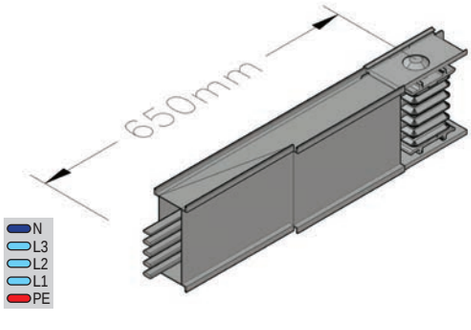
Genleşme Modülü	G

ÖRNEK SİPARİŞ

400 A Alüminyum,
Genleşme Modül IP 55 5 İletken

MP-HA405T2FG

MP-H AL İletkenli RD					
Alma Akımı	Busbar Kodu				
	16	25	31	40	50
	Düşülen Alma Akımı				
	160	250	315	400	500
250A	✓	-	-	-	-
315A	✓	✓	-	-	-
400A	-	✓	✓	-	-
500A	-	-	✓	✓	-
600A	-	-	-	✓	✓



Redüksiyon Modülü	RD

ÖRNEK SİPARİŞ

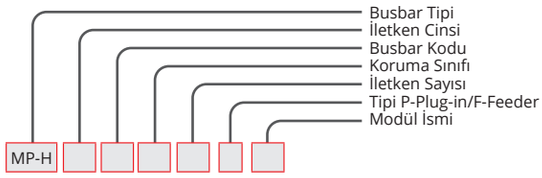
400A-250A Alüminyum,
Redüksiyon Modül IP 55 5 İletken

MP-HA405T2FRD

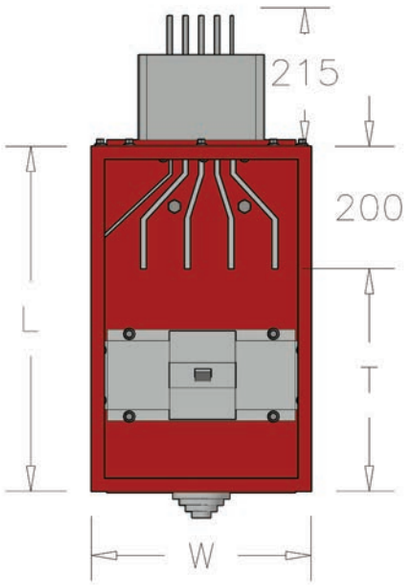
MP-H CU İletkenli RD				
Alma Akımı	Busbar Kodu			
	26	32	41	51
	Düşülen Alma Akımı			
	250	315	400	500
315A	✓	-	-	-
400A	✓	✓	-	-
500A	-	✓	✓	-
600A	-	-	✓	✓

MP-H

Besleme Kutuları



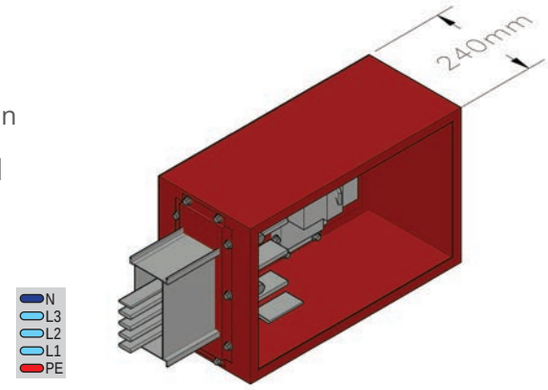
Baştan Besleme Modülü	BM1



ÖRNEK SİPARİŞ

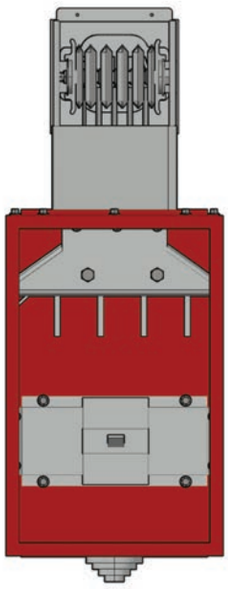
400 A Alüminyum,
Besleme IP 55 5 İletken

MP-HA405T2BM1



Sondan Besleme Modülü	BM2

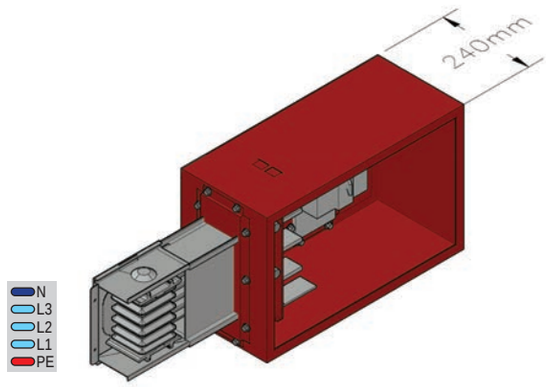
(AL)				(CU)			
AMR.	W mm	T mm	L mm	AMR.	W mm	T mm	L mm
160A	350	360	560	250A	350	360	560
250A	350	360	560	315A	350	360	560
315A	350	360	560	400A	350	360	560
400A	350	360	560	600A	350	360	560
500A	350	360	560				
600A	350	360	560				



ÖRNEK SİPARİŞ

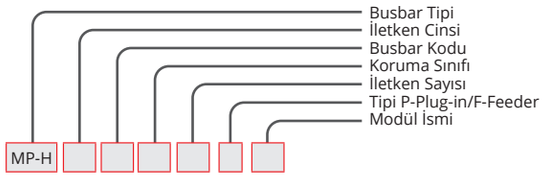
400 A Alüminyum,
Besleme IP 55 5 İletken

MP-HA405T2BM2



Standart dışı kutu için lütfen firmamızı arayınız.

Besleme Kutuları

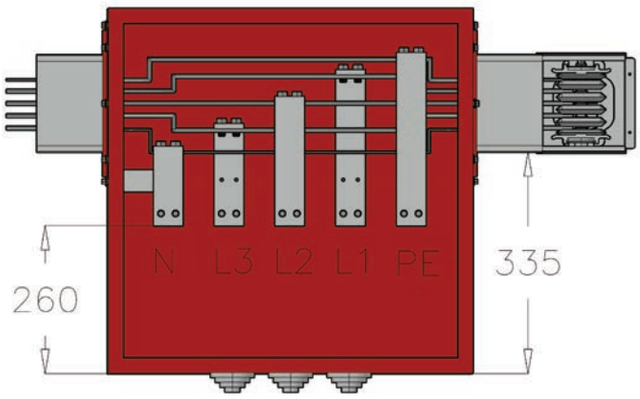


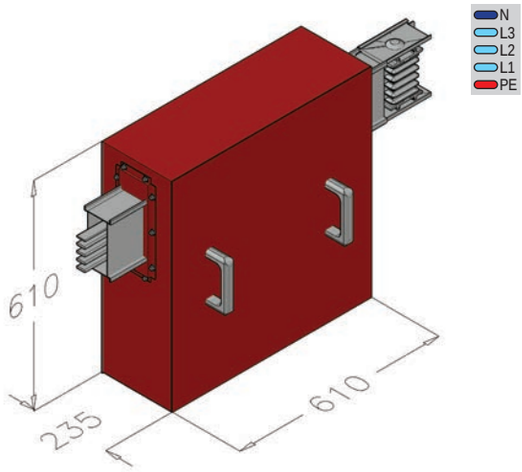
Ortadan Besleme Modülü Sol	OB1

ÖRNEK SİPARİŞ

250 A Alüminyum,
Ortadan Besleme IP 55 5 İletken

MP-HA255T2OB1



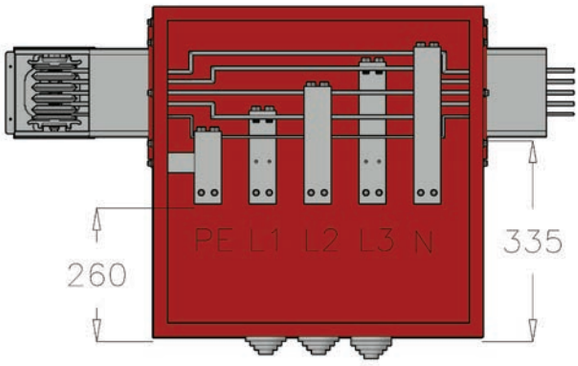


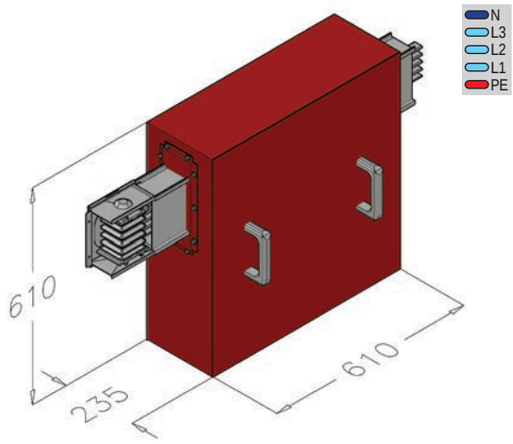
Ortadan Besleme Modülü Sağ	OB2

ÖRNEK SİPARİŞ

250 A Alüminyum,
Ortadan Besleme IP 55 5 İletken

MP-HA255T2OB2

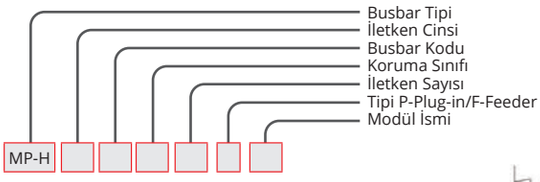


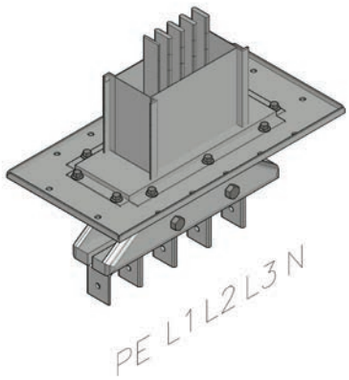


Standart dışı kutu için lütfen firmamızı arayınız.

MP-H

Pano Modülleri



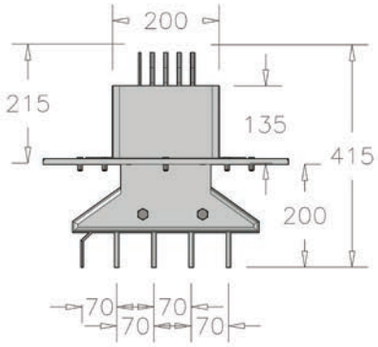


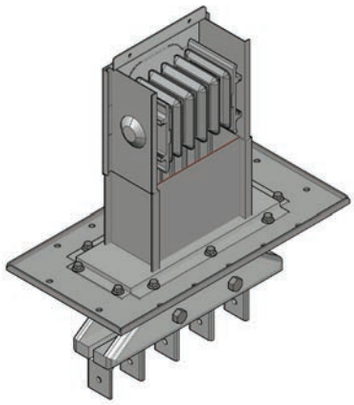
Pano Modülü (E)	PME

ÖRNEK SİPARİŞ

250 A Alüminyum,
Pano Modülü IP 55 5 İletken

MP-HA255T2PME



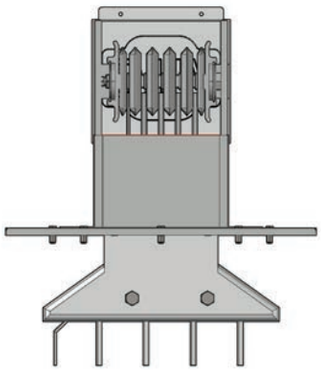


Pano Modülü (D)	PMD

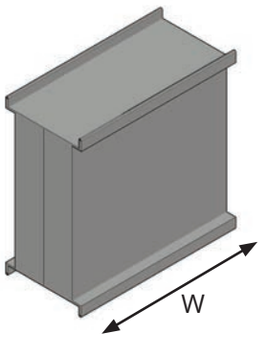
ÖRNEK SİPARİŞ

400 A Alüminyum,
Pano Modülü IP 55 5 İletken

MP-HA405T2PMD



Standart Modülleri



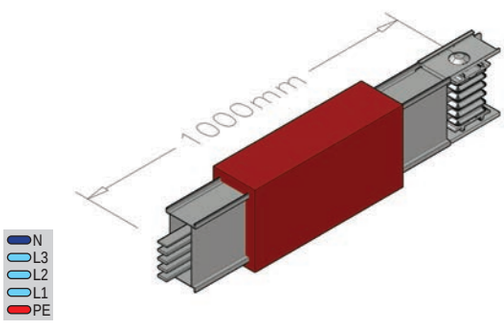
Sonlandırma Modülü	S

ÖRNEK SİPARİŞ

250 A Alüminyum,
Sonlandırma IP 55 5 İletken

MP-HA255T2S

SONLANDIRMA			
(AL)		(CU)	
AMR.	W mm	AMR.	W mm
160A	200	250A	200
250A	200	315A	200
315A	200	400A	200
400A	200	600A	200
500A	200		
600A	200		



Yatay Dilatasyon Modülü	DH

ÖRNEK SİPARİŞ

250 A Alüminyum,
Dilatasyon IP 55 5 İletken

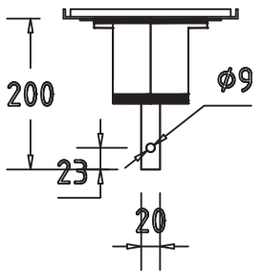
MP-HA255T2DH

Yatay Dilatasyon Bilgisi:
Uzun yatay hatlarda 40 MT bir kullanılır.

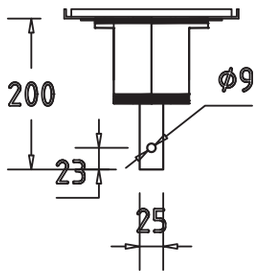
MP-H

Pano Modülleri (AL)

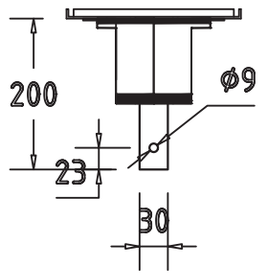
160A



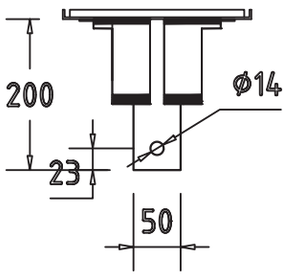
250A



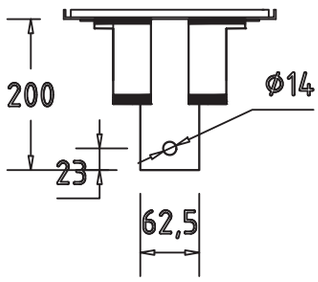
315A



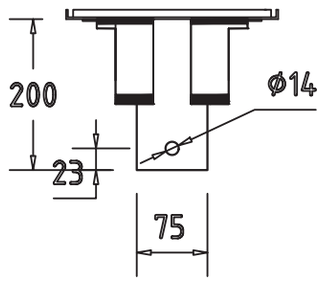
400A



500A

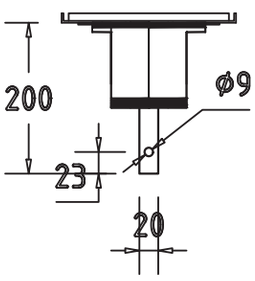


600A

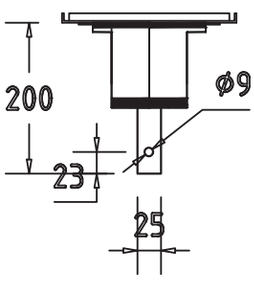


Pano Modülleri (CU)

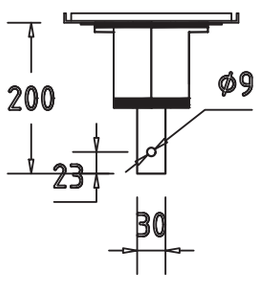
250A



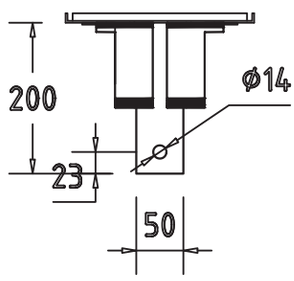
315A



400A

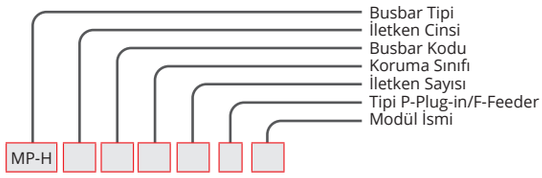


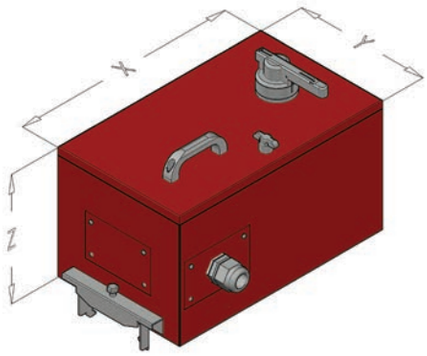
600A



MP-H

Çıkış Kutuları





Çıkış Kutusu Otomatik Şalterli	KM1

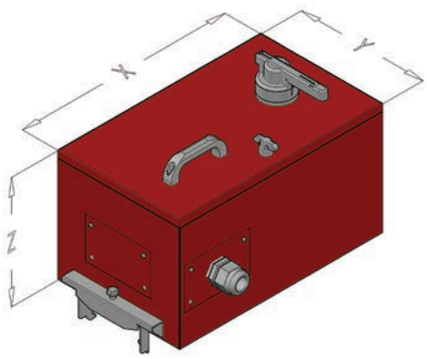
ÖRNEK SİPARİŞ

250 A Çıkış Kutusu Boş
IP 55 5 İletken

MPKM125T2KM1B

ÇIKIŞ KUTUSU OTOMATİK ŞALTERLİ				
AMP.	Kutu Kodu	X (mm)	Y (mm)	Z (mm)
160	MPKM116	530	300	220
250	MPKM125	530	300	220
400	MPKM140	710	300	220

ŞALTER TİPİ KOD	
ŞALTERLİ	BOŞ
S	B



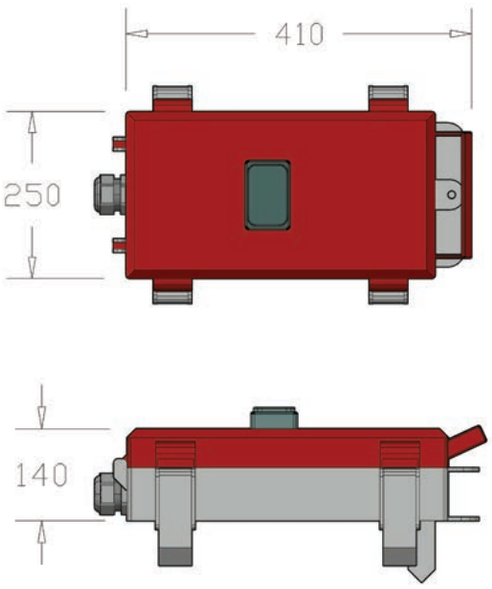
Çıkış Kutusu DTM Mekanizmalı	KM2

ÖRNEK SİPARİŞ

160 A Çıkış Kutusu Şalterli
IP 55 5 İletken

MPKM216T2KM2S

ÇIKIŞ KUTUSU DTM MEKANİZMALI OTOMATİK ŞALTERLİ				
AMP.	Kutu Kodu	X (mm)	Y (mm)	Z (mm)
160	MPKM216	530	300	220
250	MPKM225	530	300	220
400	MPKM240	710	300	220



Çıkış Kutusu Plastik	KPO

ÖRNEK SİPARİŞ

80 A Çıkış Kutusu
IP 55 5 İletken

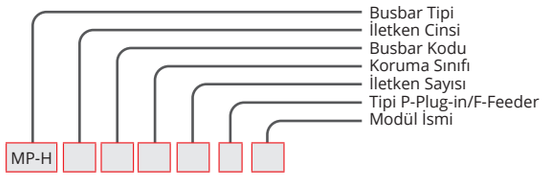
MPH0805T2KPO

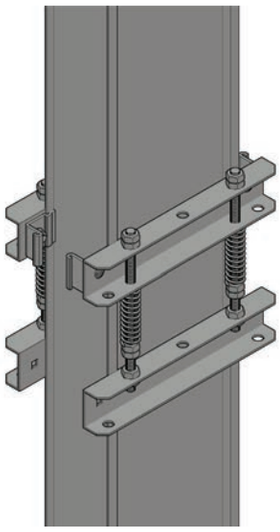
ÇIKIŞ KUTUSU OTOMATİK ŞALTERLİ VEYA SİGORTALI	
Kutu Kodu	AMP.
MPH025	25
MPH032	32
MPH040	40
MPH063	63
MPH080	80
MPH100	100
MPH125	125
MPH160	160

Standart dışı kutu için lütfen firmamızı arayınız.

MP-H

Askı Elemanları



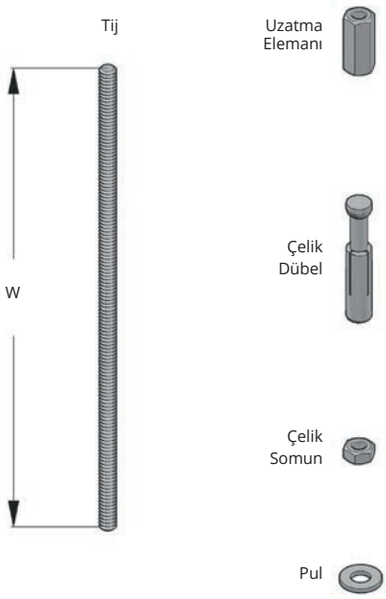


Dikey Askı (L) Şaft	SA

ÖRNEK SİPARİŞ

400 A Şaft Askı
IP 55 5 İletken

MP-HA405T2SA



Bağlantı Elemanları	RE

ÖRNEK SİPARİŞ

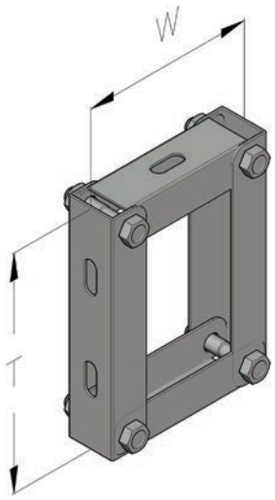
M8 Tij
500 mm

MP-HRE101

Matkap Ucu Çapı:

M8.....Ø12
M10.....Ø14

BAĞLANTI ELEMANLARI		
Açıklama	W(mm)	Kodu
B-E 8 Tij Askı (M8)	500	RE101
B-E 8 Tij Askı (M8)	1000	RE102
B-E 10 Tij Askı (M10)	500	RE103
B-E 10 Tij Askı (M10)	1000	RE104
(M8) Uzatma Elemanı	-	RE105
(M10) Uzatma Elemanı	-	RE106
M 8 Çekmeli Dübel	-	RE107
M 10 Çekmeli Dübel	-	RE108
M 8 Çelik Somun	-	RE109
M 10 Çelik Somun	-	RE110
M 8 Pul	-	BE111
M 10 Pul	-	RE112



Yatay Askı Elemanı (KELEPÇE)	YA

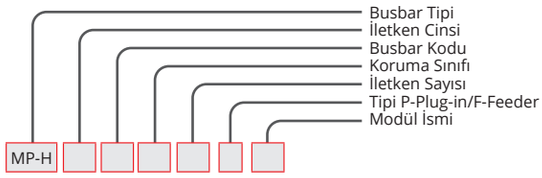
ÖRNEK SİPARİŞ

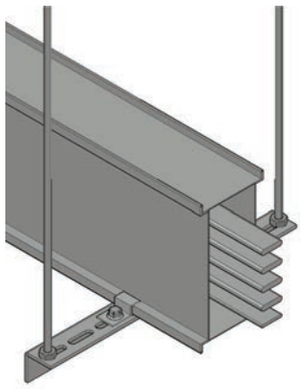
250 A Alüminyum
Yatay Askı IP 55 5 İletken

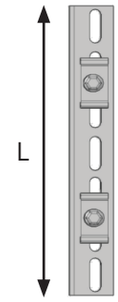
MP-H255T2YA

YATAY ASKI TAKIMI			
AL			
AMP.	Kod	T (mm)	W (mm)
160	MP-HA16	240	120
250	MP-HA25	240	125
315	MP-HA31	240	130
400	MP-HA40	240	150
500	MP-HA50	240	163
600	MP-HA60	240	175
CU			
AMP.	Kod	T (mm)	W (mm)
250	MP-HC26	240	120
315	MP-HC32	240	125
400	MP-HC41	240	130
600	MP-HC61	240	150

Askı Elemanları







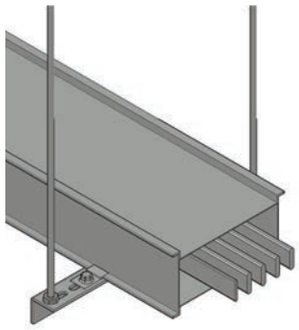
Yatay Askı Dikey Modülü (L) Köşebent	YVK

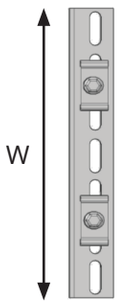
ÖRNEK SİPARİŞ

400 A Alüminyum,
Askı Elemanı IP 55 5 İletken

MP-HA405T2YVK

YATAY ASKI ÜNİTESİ DİKEY (40X40 KÖŞEBENT)			
(AL)		(CU)	
AMP.	L (mm)	AMP.	L (mm)
160A	280	250A	280
250A	285	315A	285
315A	290	400A	290
400A	310	600A	310
500A	325		
600A	335		





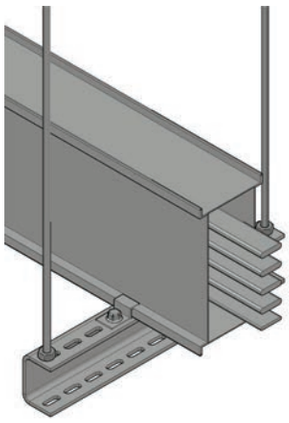
Yatay Askı Yatay Modülü (L) Köşebent	YHK

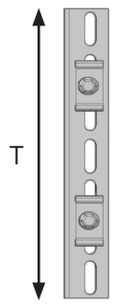
ÖRNEK SİPARİŞ

400 A Alüminyum,
Askı Elemanı IP 55 5 İletken

MP-HA405T2YHK

YATAY ASKI ÜNİTESİ YATAY (40X40 KÖŞEBENT)			
(AL)		(CU)	
AMP.	W (mm)	AMP.	W (mm)
160A	400	250A	400
250A	400	315A	400
315A	400	400A	400
400A	400	600A	400
500A	400		
600A	400		





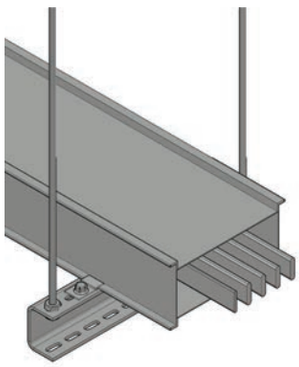
Yatay Askı Dikey Modülü (U) Profil	YVU

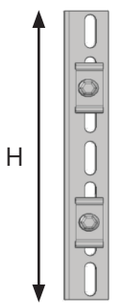
ÖRNEK SİPARİŞ

250 A Alüminyum,
Askı Elemanı IP 55 5 İletken

MP-HA255T2YVU

YATAY ASKI ÜNİTESİ DİKEY (U PROFİL) 45X45			
(AL)		(CU)	
AMP.	T (mm)	AMP.	T (mm)
160A	280	250A	280
250A	285	315A	285
315A	290	400A	290
400A	310	600A	310
500A	325		
600A	335		





Yatay Askı Yatay Modülü (U) Profil	YHU

ÖRNEK SİPARİŞ

250 A Alüminyum,
Askı Elemanı IP 55 5 İletken

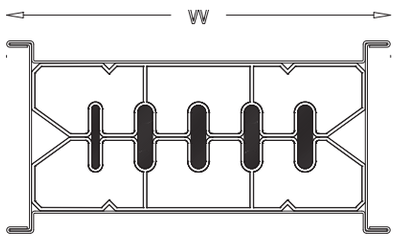
MP-HA255T2YHU

YATAY ASKI ÜNİTESİ YATAY (U PROFİL) 45X65			
(AL)		(CU)	
AMP.	H (mm)	AMP.	H (mm)
160A	400	250A	400
250A	400	315A	400
315A	400	400A	400
400A	400	600A	400
500A	400		
600A	400		

Busbar Teknik Bilgiler

ALÜMİNYUM BUSBAR EBAT VE AĞIRLIKLARI									
AL									
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT			FEDER KG/M		
	W		H	MM			3P+N+PE	3P+N+PE+PE	3P+N+PE+FE2
160	198	X	80	6	X	20	6,5	6,65	6,8
250	198		85			25	7	7,25	7,5
315	198		90			30	7,5	7,85	8,3
400	198		110			50	9,5	9,85	10,5
500	198		122,5			62,5	10,5	10,85	11,5
600	198		135			75	11,5	11,85	12,5

BAKIR BUSBAR EBAT VE AĞIRLIKLARI									
CU									
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT			FEDER KG/M		
	W		H	MM			3P+N+PE	3P+N+PE+PE	3P+N+PE+FE2
250	198	X	80	6	X	20	9,5	9,85	10,5
315	198		85			25	10,5	10,85	12
400	198		90			30	12	12,8	13,5
600	198		110			50	15,5	16,5	18,5



GALVENİZLİ SAC GÖVDE

MP-H

ELEKTRİKSEL TEKNİK VERİLER			
Akım Değeri	Direnç R (mohm/m)	Reaktans X (mohm/m)	Empedans Z (mohm/m)
Alüminyum			
160	0,29	0,29	0,41
250	0,33	0,33	0,47
315	0,27	0,27	0,39
400	0,25	0,25	0,36
500	0,12	0,12	0,17
600	0,10	0,10	0,14
Bakır			
250	0,22	0,18	0,28
315	0,18	0,16	0,24
400	0,15	0,15	0,21
600	0,10	0,12	0,15

Gerilim düşümü ΔV% hesabı aşağıdaki formüle göre yapınız.	
$\Delta V\% = \sqrt{3} \times (R \times \cos\varphi + X \times \sin\varphi) \times Ib \times L / Ue \times 100$	
R: Direnç (mohm/m) (Elektriksel teknik veriler tablosundan bulunur)	
X: Reaktans (mohm/m) (Elektriksel teknik veriler tablosundan bulunur)	
I_b: Tüm ekstra etkili yüklerin toplamı	
L: Busbar hattının toplam uzunluğu	
U_e: Besleme gerilimi	
Örnek: 160 A Busbara ait hesaplama aşağıdaki gibidir.	
(L) Hat uzunluğu	100 mt
(I_b) Etkili yük	144 A
U_b : Besleme gerilimi	400 V
Cos φ	0,80
R değeri tablodan $0,29 \times 10^{-3}$ ohm/m ve X değeri tablodan $0,29 \times 10^{-3}$ ohm/m	
(ΔV) Maksimum izin verilen gerilim düşümü 3%	
$\Delta V\% = \sqrt{3} \times (R \times \cos\varphi + X \times \sin\varphi) \times Ib \times L / Ue \times 100$	
$\Delta V\% = \frac{1,73 \times (0,29 \times 0,8 + 0,29 \times 0,6) \times 10\text{-}3 \times 144 \times 100 \times 100}{400} = 2,53\%$	
Bulunan değer %3 'ten küçüktür. 160 A Busbar seçimi gerilim düşümü hesabına göre uygundur.	

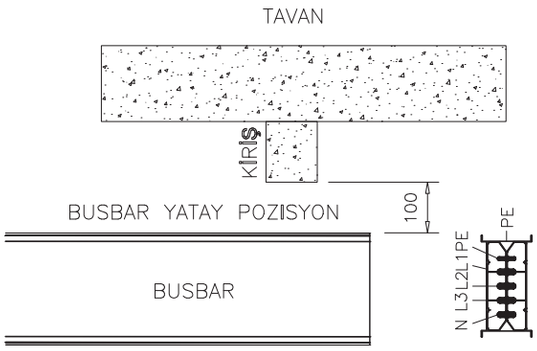
Busbar Teknik Bilgiler

TEKNİK TABLO & TECHNICAL TABLE (MP-H AL)								
ALÜMİNYUM İLETKEN (AL)								
Beyan Akımı	In	A	160	250	315	400	500	600
Busbar Kodu			MP-HA16	MP-HA25	MP-HA31	MP-HA40	MP-HA50	MP-HA60
Koruma Sınıfı	IP55							
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1							
Maks.Beyan Çalışma Gerilimi	Ue	Vac	1000					
Beyan Frekansı	f	Hz	50					
Beyan Yalıtım Gelirimi	Ui	V	1000	Kategori IV				
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK09							
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS HD 60364-4-41, madde A1)							
Beyan Kısa Süreli Akım (1s)	Icw	kA	10	15	15	30	30	35
Beyan Tepe Dayanma Akımı	Ipk	kA	17	30	30	63	63	73,5
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	6	9	9	18	18	21
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	9,18	15,3	15,3	36	36	44,1
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	6	9	9	18	18	21
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	9.18	15,3	15.3	36	36	44,1

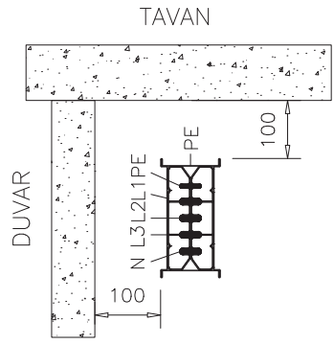
MP-H

TEKNİK TABLO & TECHNICAL TABLE (MP-H CU)						
BAKIR İLETKEN (CU)						
Beyan Akımı	In	A	250	315	400	600
Busbar Kodu			MP-HC26	MP-HC32	MP-HC41	MP-HC61
Koruma Sınıfı	IP55					
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1					
Maks.Beyan Çalışma Gerilimi	Ue	Vac	1000			
Beyan Frekansı	f	Hz	50			
Beyan Yalıtım Gelirimi	Ui	V	1000		Kategori	
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK09					
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS-HD 60364-4-41, madde A1)					
Beyan Kısa Süreli Akım (1s)	Icw	kA	18	18	26	35
Beyan Tepe Dayanma Akımı	Ipk	kA	36	36	52	72
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	10,5	10,5	14,5	20
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	21	21	31	44,3
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	10,5	10,5	14,5	20
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	21	21	31	44,3

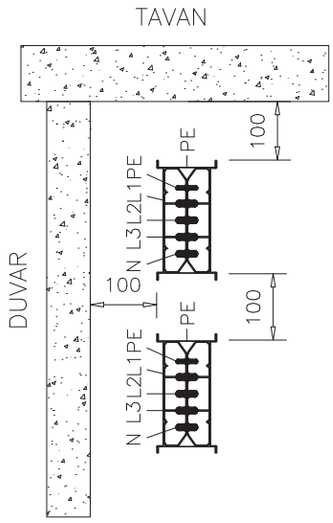
Dikey ve Yatay Busbar Uygulamaları



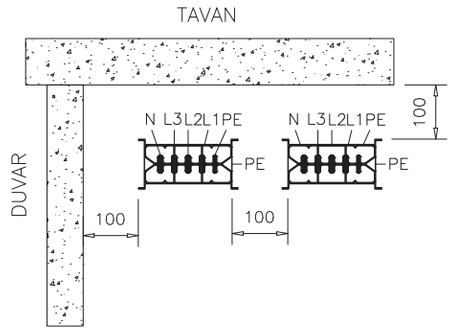
ŞEKİL–1 KİRİŞ GEÇİŞİ



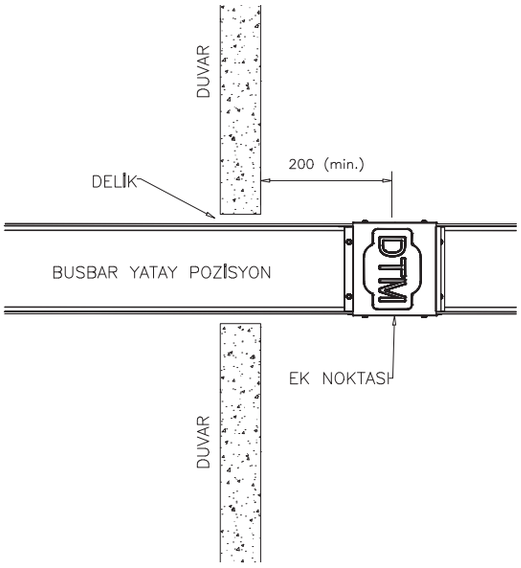
ŞEKİL–2 YATAY POZİSYON

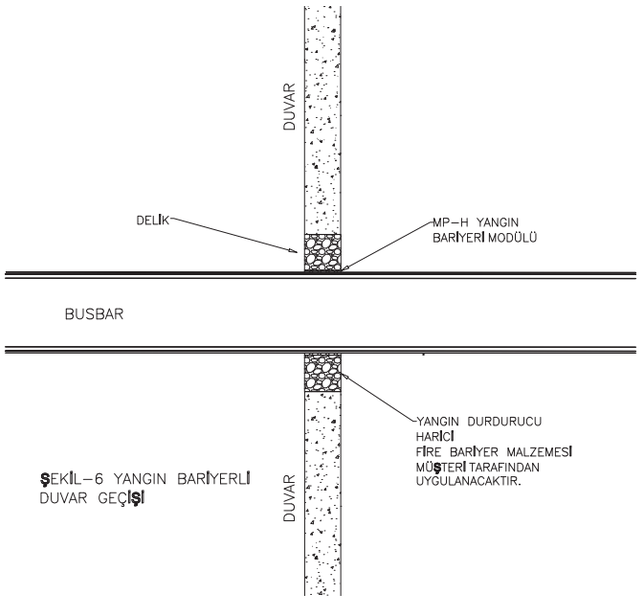


ŞEKİL–3 YATAY POZİSYON İKİLİ



ŞEKİL–4 DİK POZİSYON



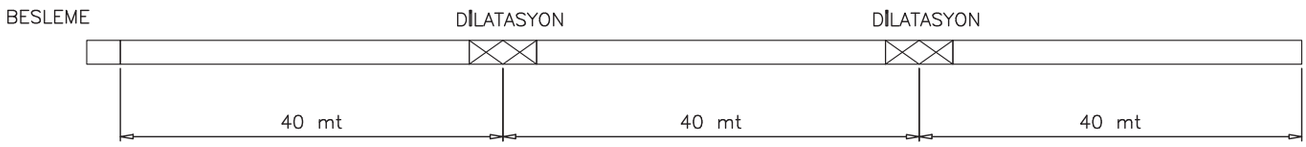


ŞEKİL–6 YANGIN BARİYERLİ DUVAR GEÇİŞİ

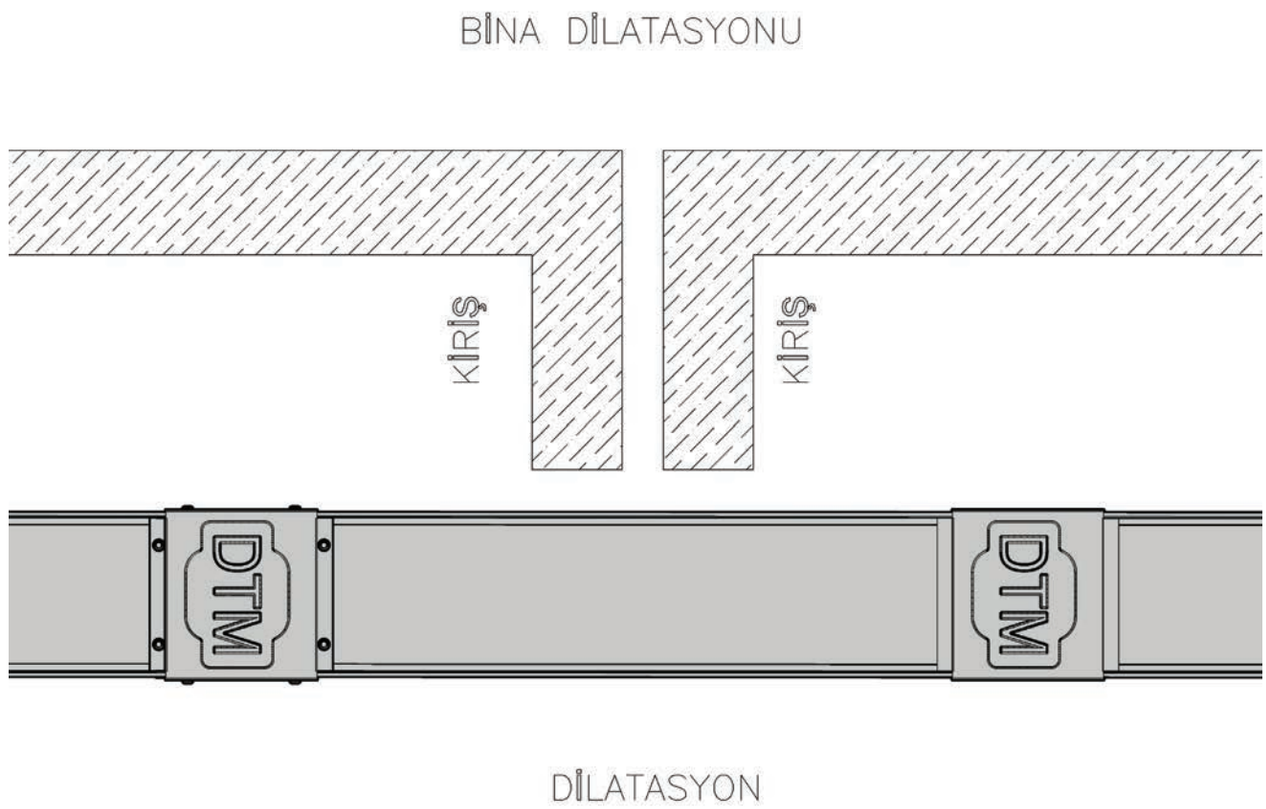
Tüm ölçüler mm cinsinden verilmiştir. Yukarıda verilen ölçüler minimum değerlerdir.

MP-H

Yatay Dilatasyon Modül Uygulamaları



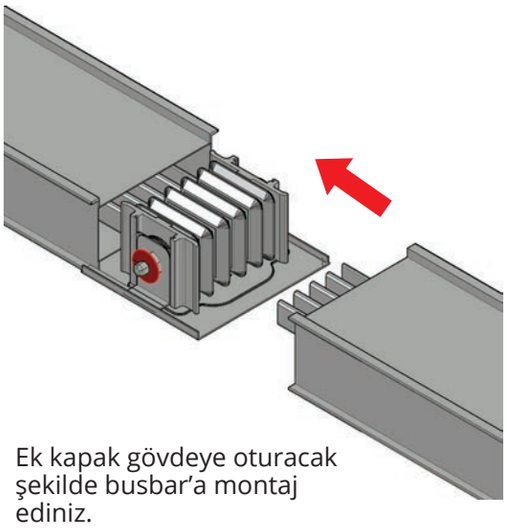
Şekil 1. Yatay dilatasyon uygulaması



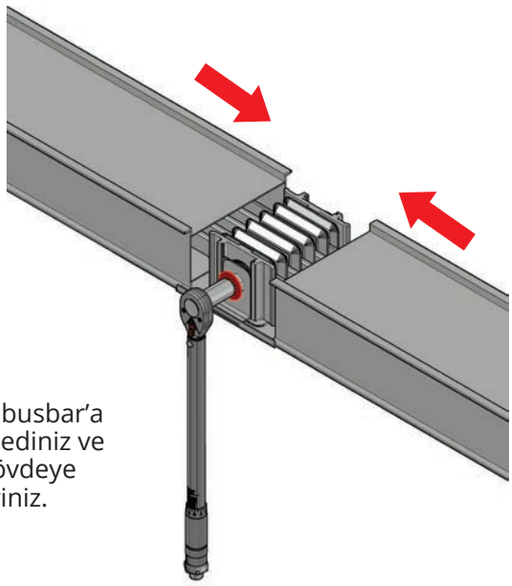
Şekil 2. Yatay bina dilatasyon uygulaması

Yatay dilatasyon iki bina arası geçişlerinde kullanılır.
Ayrıca yatay busbar hattı 40 mt ‘de bir kulanılmalıdır.

Montaj Şekli

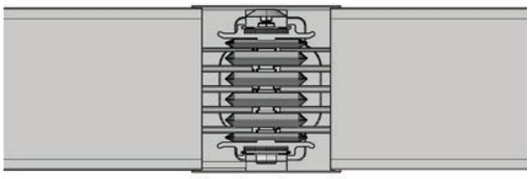


1 Ek kapak gövdeye oturacak şekilde busbar'a montaj ediniz.

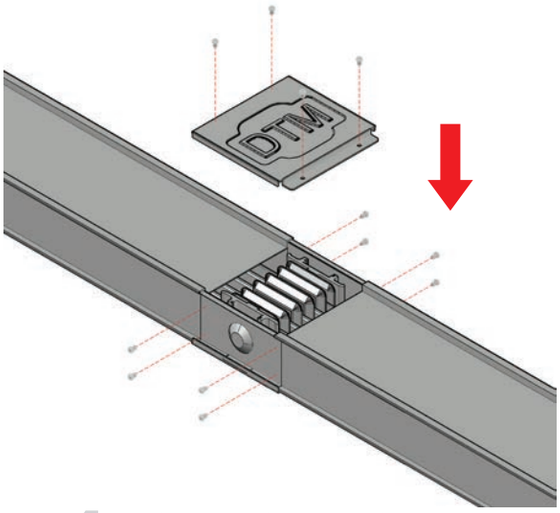


2 Ek blok busbar'a montaj ediniz ve diğer gövdeye sabitleyiniz.

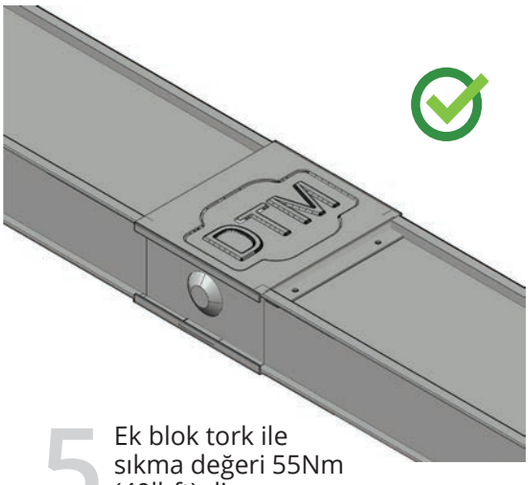
EK BLOK SIKMA DEĞERİ: 40 lbft (55 Nm)



3 Kopma başlı cıvata'yı birinci kafa kopana kadar sıkınız.



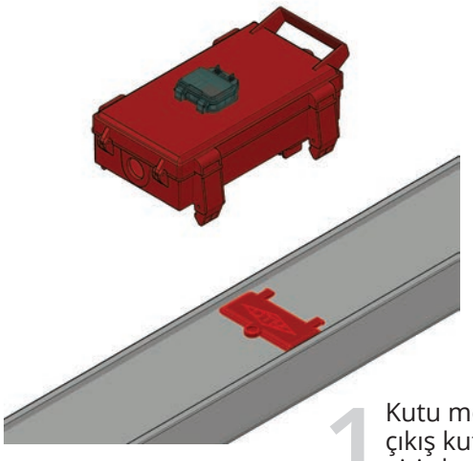
4 Ek kapağını kapatmadan izolatörlerin çatlak veya kırık olup olmadığına kontrol ederek ek kapağını montaj ediniz.



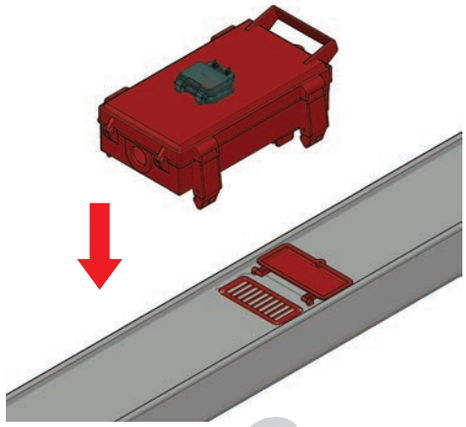
5 Ek blok tork ile sıkma değeri 55Nm (40lbft) dir.

MP-H

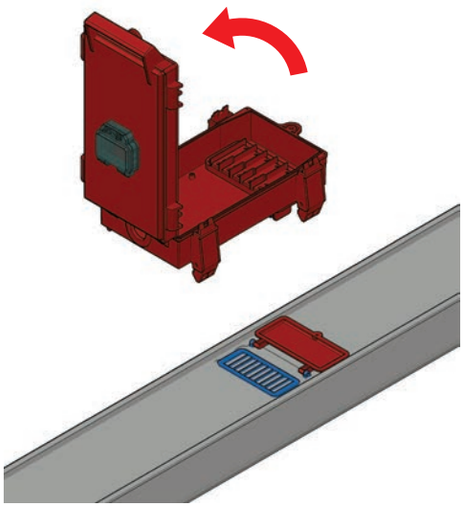
Plastik Kutu Montaj



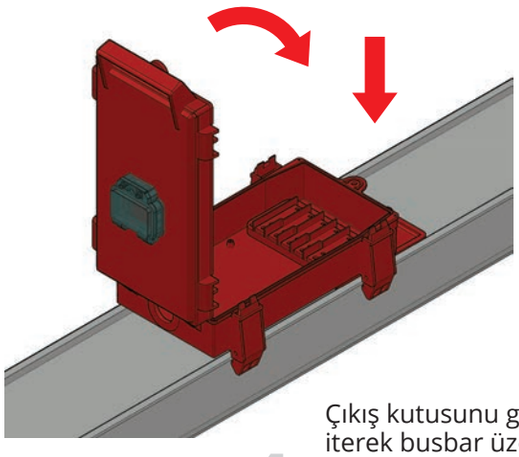
1 Kutu montaj edilirken çıkış kutusunun alt giriş kısımındaki çıkıntıya dikkat ederek prize montaj ediniz.



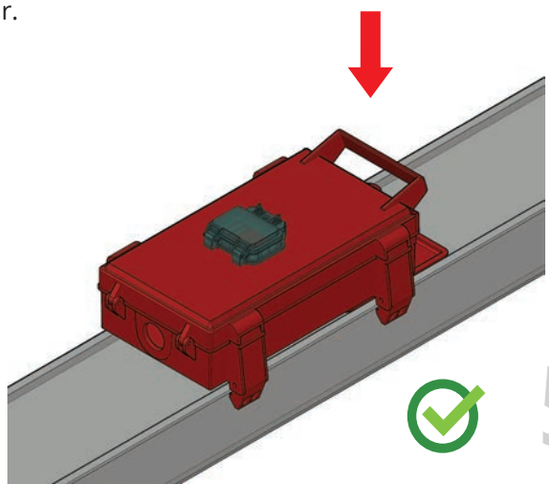
2 Priz kapağını açınız.



3 Çıkış kutusunun kapağını açarak busbar'a oturtarak montaj edilmelidir.



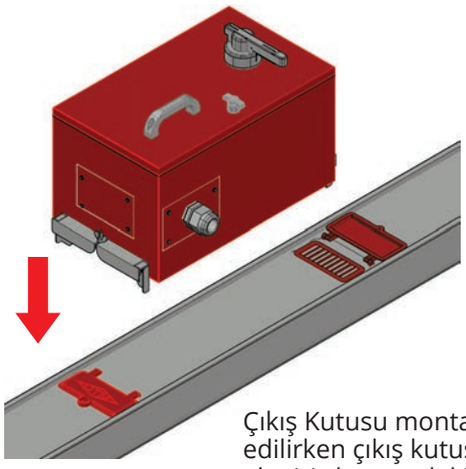
4 Çıkış kutusunu gövdeden iterek busbar üzerine oturmasını sağlayınız. Busbar üzerine oturmasına dikkat ediniz.



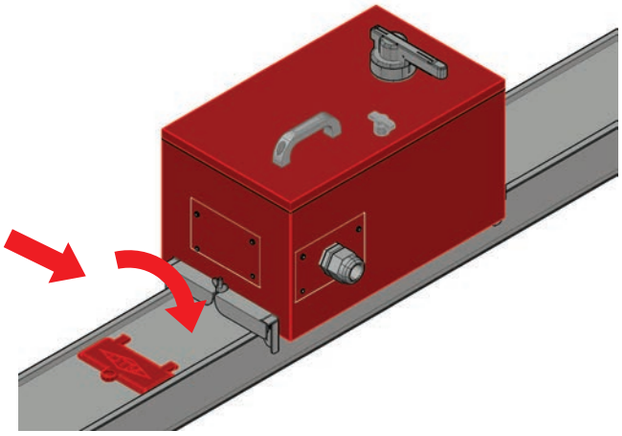
5 Çıkış kutusunun kapağını kapatınız. Özel mekanizmalı kapak yardımı ile kapak kapanması durumunda enerji devreye girer.

MP-H

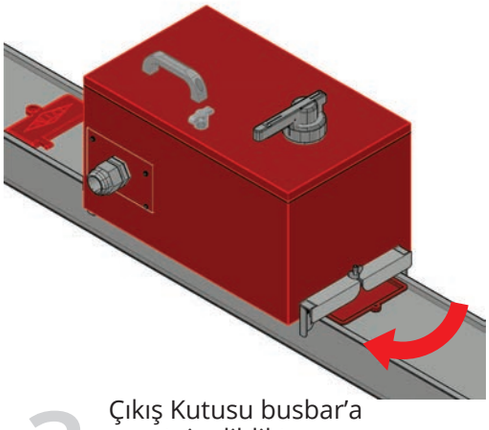
Metal Kutu Montaj



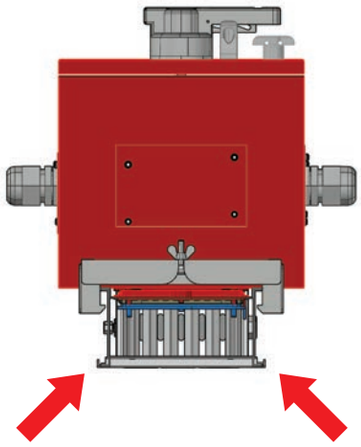
1 Çıkış Kutusu montaj edilirken çıkış kutusunun alt giriş kısımındaki çıkıntıya dikkat ederek prize montaj ediniz.



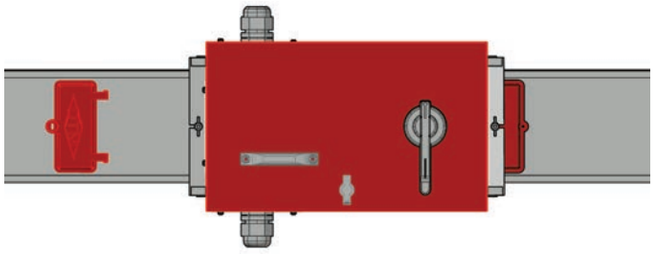
2 Çıkış Kutusu busbar'a montaj edildikten sonra kutu alt kelepçeleri sıkınız.



3 Çıkış Kutusu busbar'a montaj edildikten sonra kutu üst kelepçeleri sıkınız.



4 Çıkış Kutusu busbar'a montajı bittikten sonra kutu alt kelepçelerini busbar gövdesine tamamen oturmasına dikkat ediniz.



5 Çıkış Kutusu özel mekanizma yoluyla devreye alınız. Mekanizma (OFF) da iken Kapak kapatılır (ON) konumunda iken enerji verilir.
NOT: Emniyet nedeniyle (ON) Konumunda kutu kapağı mekanizma nedeniyle açılmasını engellenir.

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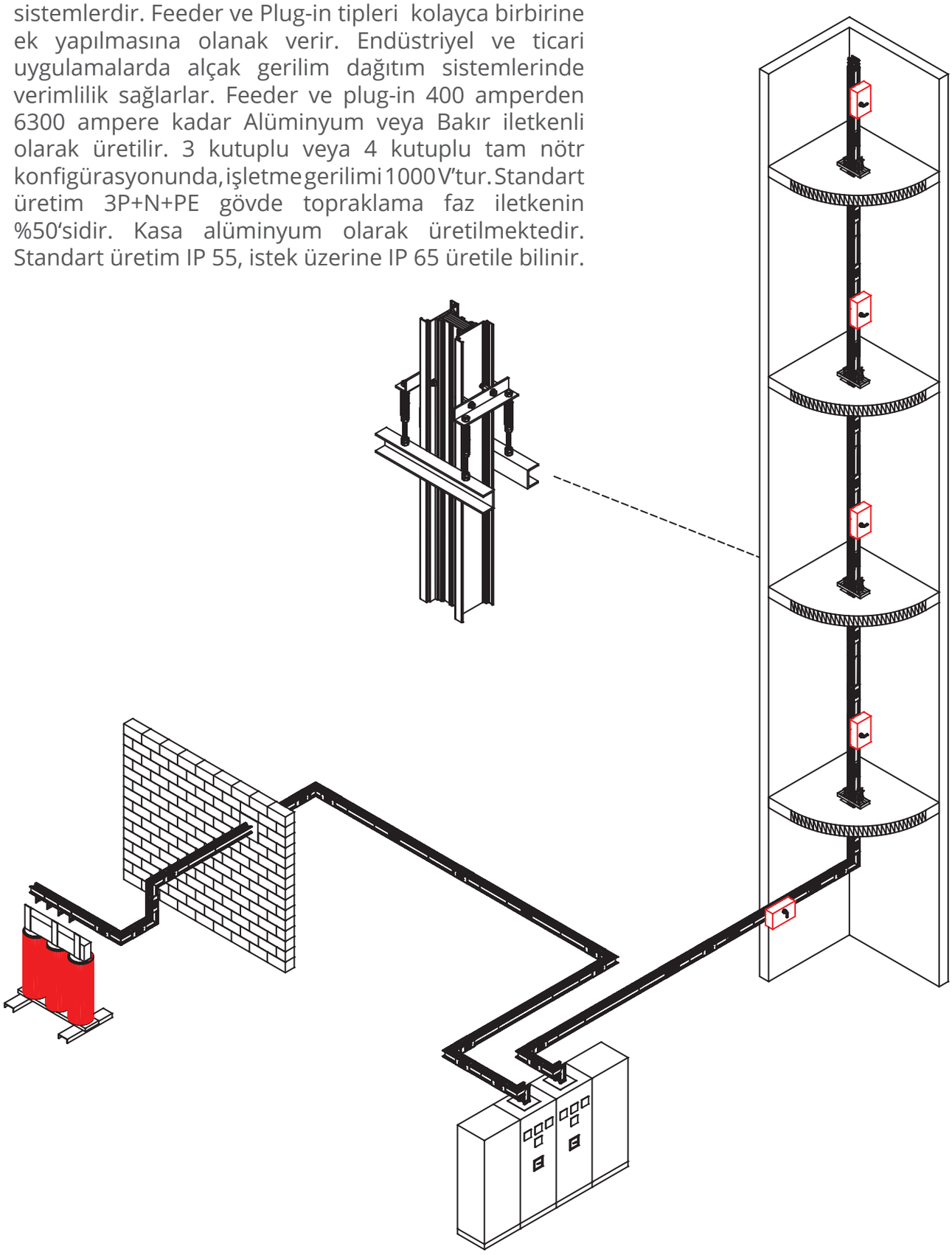
GENEL ÖZELLİKLER

Busbar Trunking sistemleri komplike alçak gerilim enerji dağıtım hatlarına uyumlu sandviç yapıda olan sistemlerdir. Feeder ve Plug-in tipleri kolayca birbirine ek yapılmasına olanak verir. Endüstriyel ve ticari uygulamalarda alçak gerilim dağıtım sistemlerinde verimlilik sağlarlar. Feeder ve plug-in 400 amperden 6300 ampere kadar Alüminyum veya Bakır iletkenli olarak üretilir. 3 kutuplu veya 4 kutuplu tam nötr konfigürasyonunda, işletme gerilimi 1000 V'tur. Standart üretim 3P+N+PE gövde topraklama faz iletkenin %50'sidir. Kasa alüminyum olarak üretilmektedir. Standart üretim IP 55, istek üzerine IP 65 üretile bilinir.



HP-K

Kullanım Yerleri

Trafo-Pano arası, yüksek hizmet binaları, ticari merkezler, sanayi tesisleri, askeri tesisler, kamu binaları gibi yüksek akım gereksinimi olan yerlerde kullanılır.

Feeder ve Plug-in busbarlar montajı kolay sandviç tip sistemlerdir. Yapısı itibarı ile voltaj düşümü karakteristikleri minimumda olup düzenli düşük reaktif güç faktörü sağlar. Konstrüksiyon kanalları alüminyum profil ve alt üst kapakları alüminyum olarak dizayn edilmiştir. Hysteresis akımlar ve Eddy akımlar alüminyumdan oluşan kanal içinde yayılması sağlanarak en aza indirilmiştir. Feeder ve Plug-in boylarda faz başına 2 veya 3 iletken kullanılan durumlarda her bir fazın sonunda paralelleme yapılır.(Fazların iletken değişikliğinde) Bu busbarın tek tarafına çıkış kutusu montaj edilmesinde ve busbarın yükünü eşit dağıtmaya yardımcı olur. Plug-in boyların gövdesinde düz montaj ve tap off ların çıkışına izin veren kapaklı pencereler vardır. Feeder için kullanılan ek aksesuarları Plug-in tiplerdede kullanılabilir. Plug-in ve Feeder tipleri birbirine monte edilebilir.

Tam Kapalı Konstrüksiyon

Busbar sistemleri tamamen kapalı dizayna sahiptir. Bu kanal dizaynı elektrik değerlerini düşürmez ve havalandırma delikleri olmadığından dolayı iletkenlerin yabancı bir madde ile teması engellenir. Isı dağılımı gövdenin iletkenlere yakın olması ile direk yayılır.

Boyama

RAL 7038

Busbar kanal sistemlerinde elektrostatik boya uygulanmaktadır.

İzolasyon ve Ürün Özellikleri

Tüm baralar epoksi reçine uygulanır. Ek noktaları yüzeyinde düşük kontak rezitansı ve yüzey korozyonu minimize etmek için kalay kaplanmıştır. Ek bloğu iletkenleri opsiyon olarak gümüş kaplanabilir.

Ekonomik

Busbar kanal sistemleri kablolu kanal sistemine göre daha az yer kaplar ve montaj maliyeti düşüktür.

BUSBAR ÖZELLİKLERİ

Voltaj Düşümü

Kompakt yapısı itibarı ile oldukça düşük reaktanstan dolayı voltaj düşümü minimize edilerek gücün en verimli şekilde iletilmesini sağlar.

Ek Yerleri

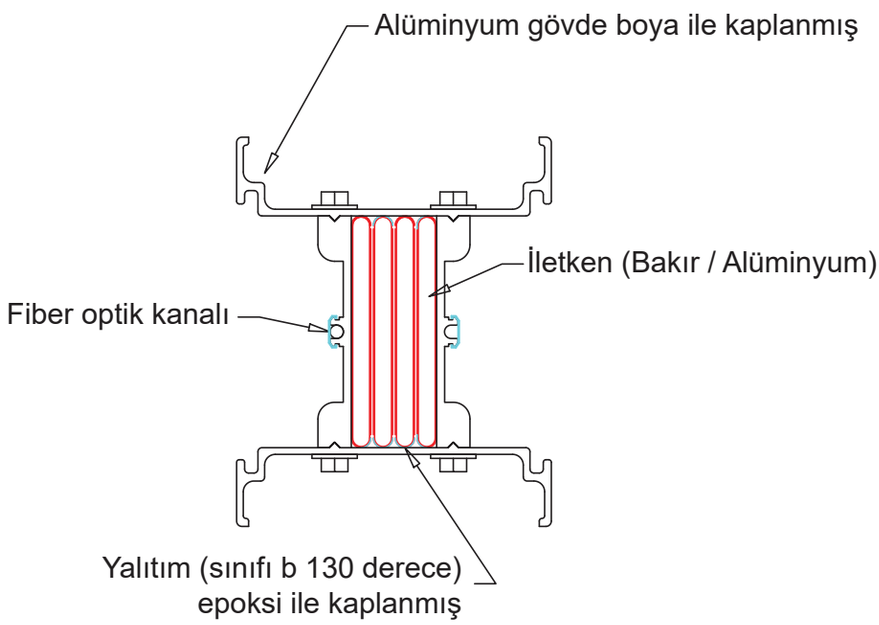
Harici feeder busbarlarda yağmur suyunun içerisine girmesini önlemek için özel conta ile uygulanmış ek yerleri her şartlarda koruma ve düzgünlük sağlar.

Fitingler

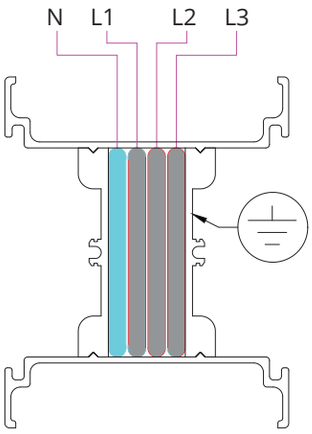
Dirsekler ek blok ile rahatlıkla eklenebilir.

Plug-In'ler (Prizler)

Plug-in'ler V2 (yanmamazlık) özelliğine sahip, oluşan olumsuz çevre koşullarına karşı dayanıklı ve yüksek sıcaklıklara mukavimdir. Ağır darbeye karşı direnç gösterir. Alev geciktirme sertifikalı malzemeden contalı koruma kapağı IP 55'dir. Çatal ağzı girişli kontak yüzeyleri iletkenleri baskı yay sayesinde geçirgenlik sağlar.

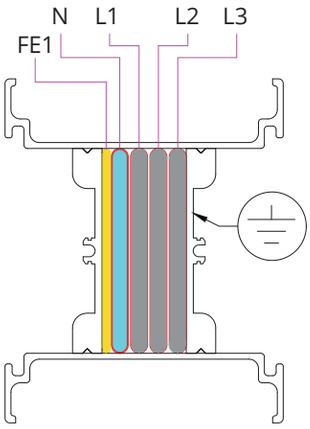


Üretim Ürünleri		
	AL	CU
400A	✓	✓
500A	✓	✓
630A	✓	✓
800A	✓	✓
1000A	✓	✓
1250A	✓	✓
1350A	✓	✓
1600A	✓	✓
2000A	✓	✓
2250A	✓	✓
2500A	✓	✓
2000A	✓	✓
2500A	✓	✓
3000A	✓	✓
3200A	✓	✓
3300A	✓	✓
3600A	✓	✓
4000A	✓	✓
4250A	✓	✓
5000A	✓	✓
6300A	✓	✓
✓	Standart Üretim	



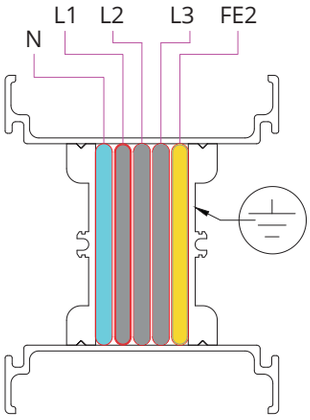
3P+N+PE (Housing) (4P) (T2)

Nötr iletken kesiti faz iletkeni ile aynı topraklama için kullanılan kasa kesiti faz iletkeni kesitinden büyüktür.



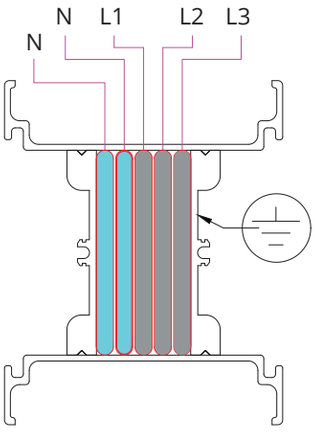
3P+N+FE1+PE (Housing) (5P) (T3)

Nötr iletken kesiti faz iletkeni ile aynı topraklama kesiti 1/2 olarak aynı kasa içerisine konulur.



3P+N+FE2+PE (Housing) (5P) (T4)

Nötr iletken kesiti faz iletkeni ile aynı topraklama %100 kesiti aynı olarak kasa içerisine konulur.



3P+2N+PE (Housing) (5P) (T5)

Nötr iletken kesiti faz iletkeni ile aynı nötr iletken kesiti faz iletkeninin iki katıdır.

Ortam Şartları

Dahili Tesisat ..... ☐
Harici Tesisat ..... ☐
Çatılı ..... ☐ Çatısız ..... ☐
Minimum Hava Sıcaklığı Dahili ..... °C
Harici ..... °C
Maksimum Hava Sıcaklığı Dahili ..... °C
Harici ..... °C
Hava Sıcaklığı 24 Saat Ortalaması Dahili ..... °C
Harici ..... °C
Nem Oranı Min ..... °C
Max ..... °C
Tesisat Yapılan Ülke .....

Elektrik Dataları

Nominal Akım .....A
Demeraj Akım .....A
Faz Kutupları 3P+Pe ☐
3P+N+Pe ☐
3P+Pen ☐
3P+2N+Pe ☐
3P+N+Fe/2+Pe ☐
3P+N+Fe+Pe ☐
Çalışma Voltajı V
AC ☐ DC ☐
Faz Kısa Devre .....kA (1s)
Max Voltaj Düşümü ΔV..... %
Minumum Koruma Derecesi IP.....
İletken Metalleri AL ☐ Bakır ☐

Busbar Tipleri

Feeder Busbar Transformotordan Panoya ☐
Feeder Busbar Panodan Panoya ☐
Feeder Busbar Jenaratörden Panoya ☐
Plug-in Busbar Çıkış Üniteleri ☐
Busbar Toplam Uzunluk .....
Feeder .....m
Plug-in .....m
Dirsekler .....ad

Bağlantı

Busbar ve Pano Arası Evet ☐ .....Hayır ☐
Busbar ve Transformotor arası Evet ☐ .....Hayır ☐
Trafo Recine Evet ☐ .....Hayır ☐
Trafo Özelliği Kuru☐ .....Yağlı ☐

Çıkış Kutuları

Boş Sigorta Altlıklı ☐ Sigorta Altlıklı Yük Kesici ☐
Otomatik Şalterli Boş ☐ Otomatik Şalterli ☐

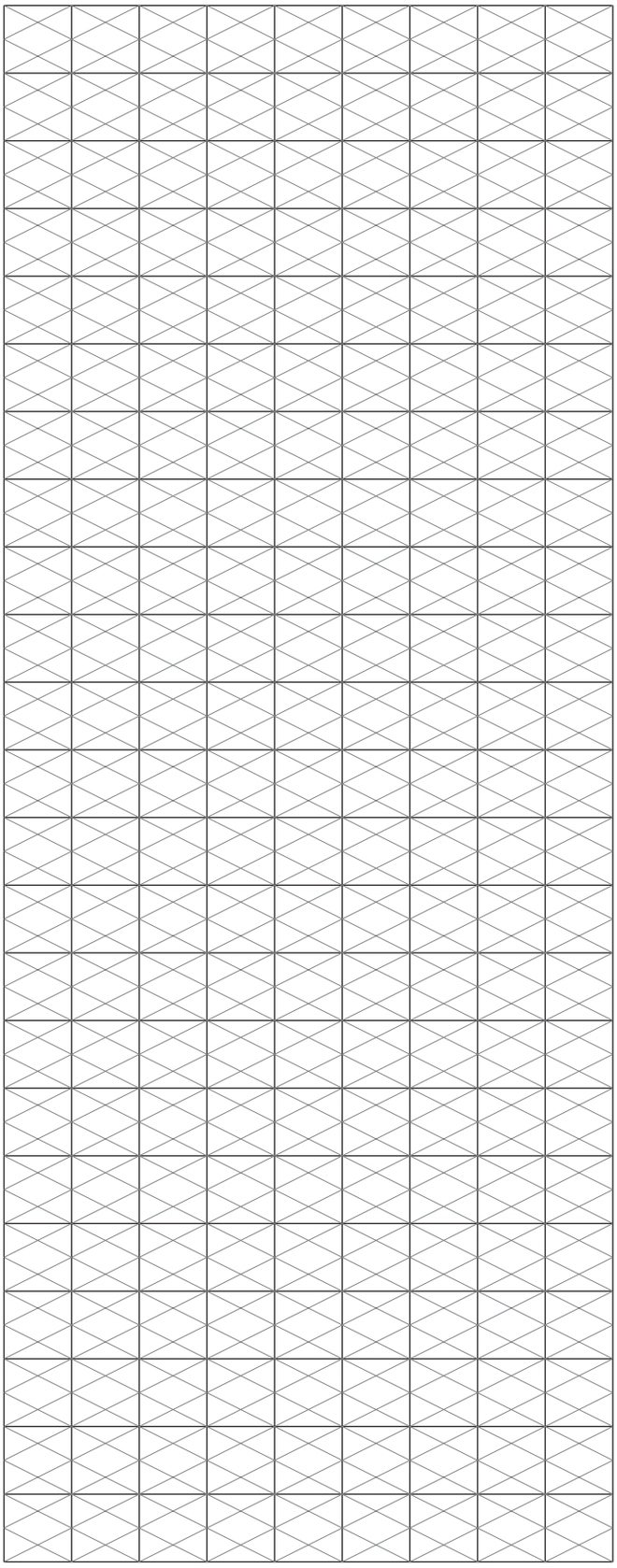
Askı Takımları

Tavan Askı Bareti ☐ Duvar Askı Bareti ☐

Yangın Bariyer Ünitesi

Yangın Bariyer Ünitesi ..... min. ☐
Fitingler için dönüş taslaklar isometrik dökümanlar.

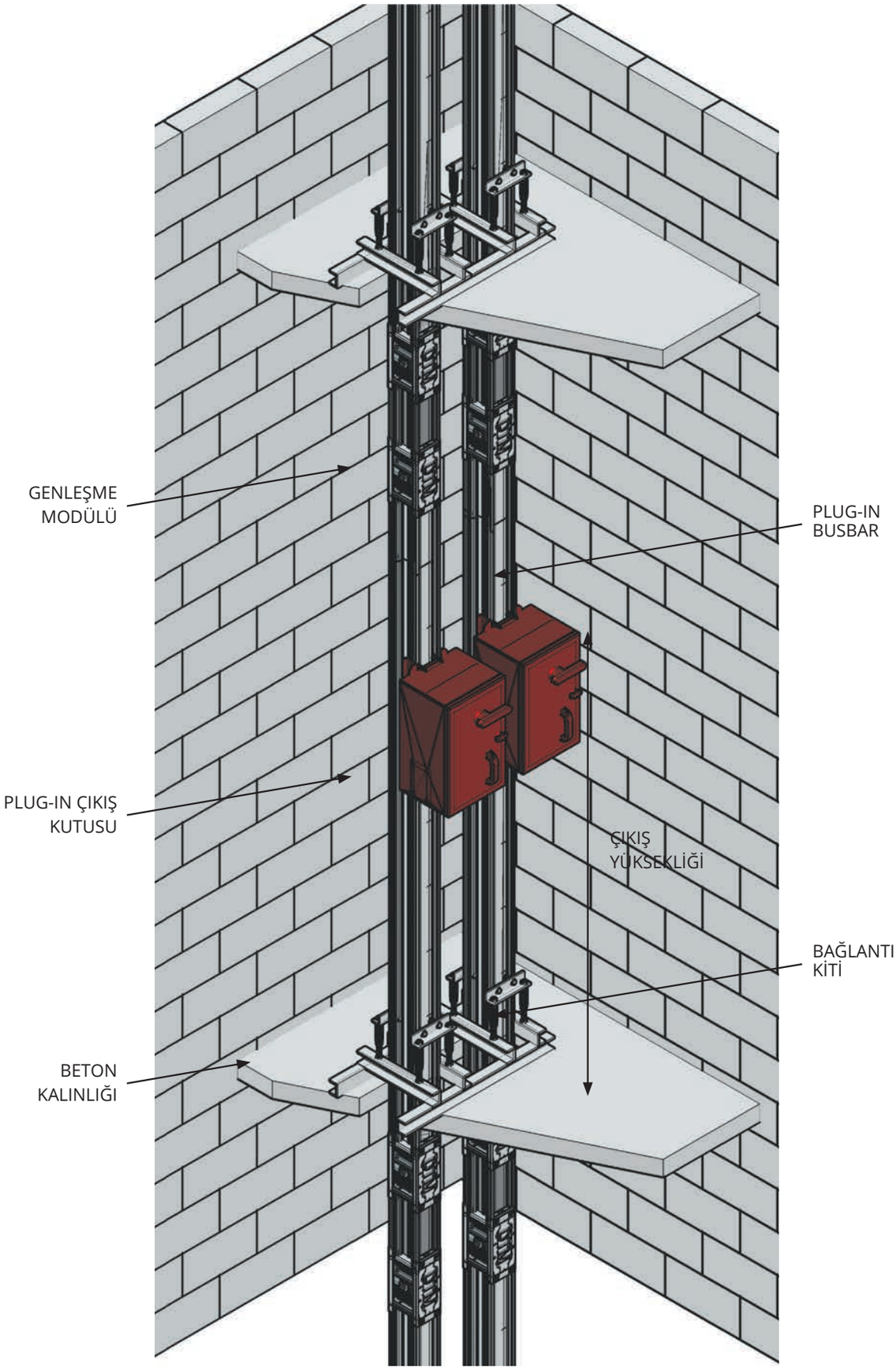
PROJE DETAY ÖLÇÜLERİNİ ÇİZİN



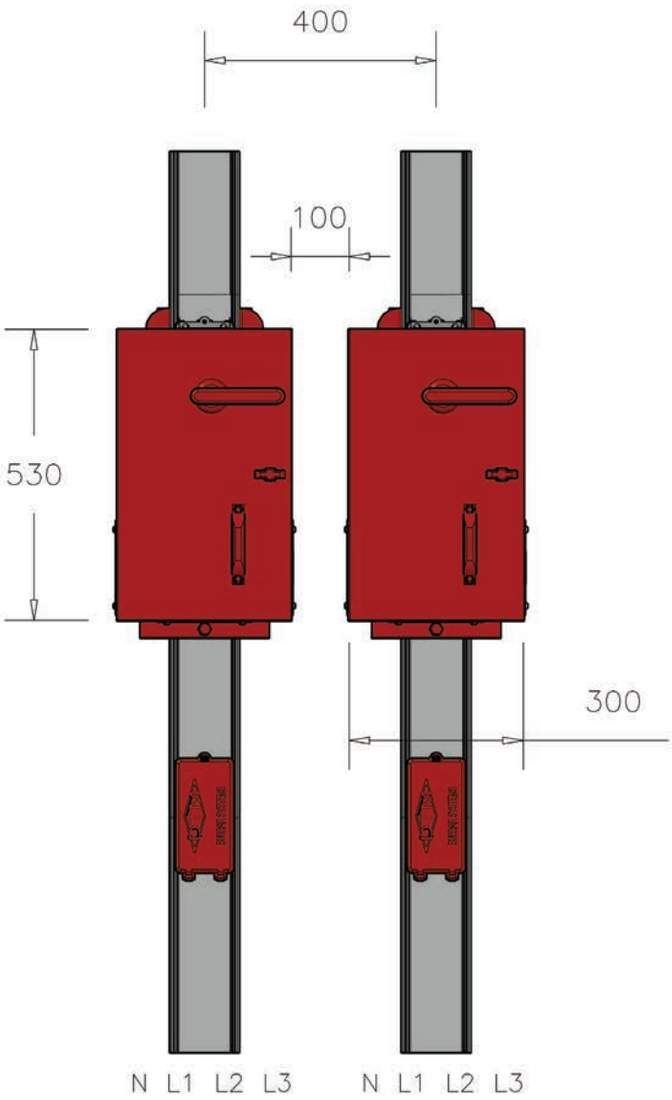
MÜŞTERİ ONAY

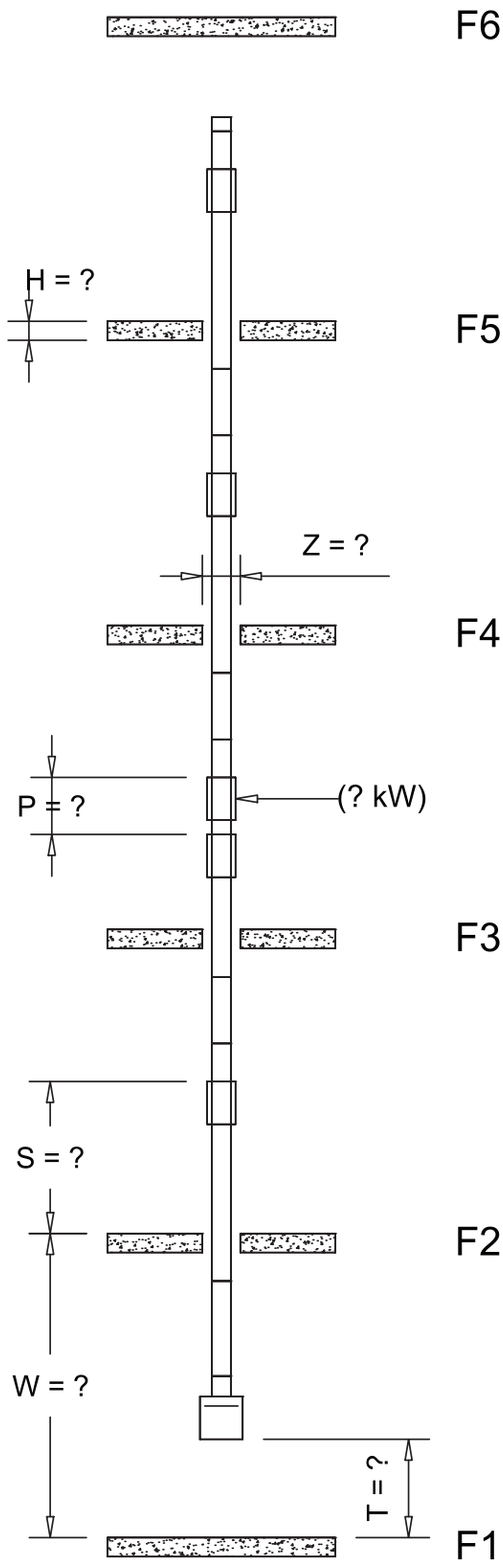
HP-K

DİKEY DAĞITIM PROJESİ



DİKEY DAĞITIM PROJESİ





H = Beton Kalınlığı (cm ?)
W = Kat Yüksekliği (cm ?)

HP-K

SİPARİŞ KOD SİSTEMİ

HP-K	A	08	5	T2	F	DDR

- Busbar Tipi
- İletken Cinsi
- Busbar Kodu
- Koruma Sınıfı
- İletken Sayısı
- Tipi P-Plug-in/F-Feeder
- Modül İsmi

Busbar Tipi

BUSBAR ADI

İletken Cinsi

ALÜMİNYUM (AL)	(A)
BAKIR (CU)	(C)

Busbar Akımı

HP-K AL		HP-K CU	
AKIM	BUSBAR KODU	AKIM	BUSBAR KODU
400	04	550	05
500	05	650	06
630	06	800	07
800	08	1000	09
-	-	1250	13
1000	10	1350	15
1250	12	1600	17
1350	14	-	-
-	-	2000	21
1600	16	-	-
-	-	2250	23
2000	20	2500	24
2500	25	-	-
-	-	2000	22
-	-	2500	27
2500	26	3300	33
-	-	3600	36
3000	30	4000	41
3200	32	-	-
-	-	4250	42
4000	40	5000	51
5000	50	6300	64
6300	63		

Koruma Sınıfı

IP55	5
IP67	6

İletkin Sayısı

İLETKEN SAYISI	KODU	L1	L2	L3	N	1/2 TOPRAK	TEMİZ TOPRAK	1/2 TEMİZ TOPRAK	TOPRAK (GÖVDE)
3P+PE (3P)	T1	✓	✓	✓					✓
3P+N+PE (4P)	T2	✓	✓	✓	✓				✓
3P+N+PE+FE1 (5P)	T3	✓	✓	✓	✓	✓			✓
3P+N+PE+FE2 (5P)	T4	✓	✓	✓	✓			✓	✓
3P+2N+PE (5P)	T5	✓	✓	✓	✓		✓		✓

Tipi P-Plug-in /F-Feeder

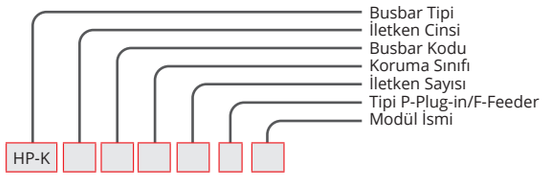
Tipi: Busbar Kullanım Amacı ile İlgili Bilgiler.

(P) PLUG-IN DÜZ BOYLARDA PLUG-IN YERLERİNDEN AKIM ALINMASINDA KULLANILIR.
(F) FEEDER EK NOKTALARINDAN AKIM ALINMASI GEREKEN VE DİREK BESLEME YAPILAN YERLERDE KULLANILIR.

Modül İsmi

Feeder Busbar	FS
Plug-In Busbar	PS
Yatay Dirsek Yukarı	YDU
Yatay Dirsek Aşağı	YDD
Dikey Dirsek Sola	DDL
Dikey Dirsek Sağa	DDR
Feeder Ara Boy	FX
Plug-In Ara Boy	PX
Çift Dikey Dirsek (Off-Set) Yukarı	DOU
Çift Dikey Dirsek (Off-Set) Aşağı	DOD
Çift Dikey Dirsek (Off-Set) Sol	YOL
Çift Dikey Dirsek (Off-Set) Sağ	YOR
Yukarı Sola (Kombine Off-Set)	ULK
Yukarı Sağa (Kombine Off-Set)	URK
Sola Aşağı (Kombine Off-Set)	LDK
Sağa Aşağı (Kombine Off-Set)	RDK
Sola Yukarı (Kombine Off-Set)	LUK
Sağa Yukarı (Kombine Off-Set)	RUK
Aşağı Sola (Kombine Off-Set)	DLK
Aşağı Sağa (Kombine Off-Set)	DRK
Ortadan (T) Modülü	OT
Sağa (T) Modülü	RT
Sola (T) Modülü	LT
Rediksiyon	RD
Genleşme Modülü	G
Pano Bağlantı Modülü (E)	PME
Pano Bağlantı Modülü (D)	PMD
Pano Dikey Bağlantı Modülü Yukarı	PM1
Pano Dikey Bağlantı Modülü Aşağı	PM2
Pano Dikey Bağlantı Modülü Yukarı	PM3
Pano Dikey Bağlantı Modülü Aşağı	PM4
Pano Yatay Bağlantı Modülü Sola	PM5
Pano Yatay Bağlantı Modülü Sağa	PM6
Pano Yatay Bağlantı Modülü Sola	PM7
Pano Yatay Bağlantı Modülü Sağa	PM8
Mekanizmali (Plug-In)	HPP
Kompakt Şalterli (Plug-In)	HPS
Kompakt Şalterli (Bolt-On)	HPB
Mekanizmali (Bolt-On)	HPM
Dikey Trafo Modülü	TR1
Yukarı Trafo Modülü	TRU
Aşağı Trafo Modülü	TRD
Sağa Trafo Modülü	TRR
Sola Trafo Modülü	TRL
Yatay Trafo Bağlantı Modülü	TMH
Yatay Trafo Bağlantı Modülü	TMF
Trafo Bağlantı Modülü	TMK
Trafo Bağlantı Modülü Ortadan	TMO
Baştan Besleme Modülü	BM1
Sondan Besleme Modülü	BM2
Ortadan Besleme Modülü	OB
Çaprazlama Modülü	CM
Sonlandırma Modülü	S1
Yatay Dilatasyon	YD
Yatay Askı Dikey Modülü (Özel)	YVA
Duvar Askı Takımı (Yatay)	DYA
Yatay Askı Dikey Modülü (U Profil)	YVU
Yatay Askı Yatay Modülü (U Profil)	YHU
Yatay Askı Dikey Modülü (45x65 Köşebent)	YUD
Yatay Askı Yatay Modülü (45x65 Köşebent)	YUY
Şaft Askı Modülü (Yaylı)	SA
Yatay Pano Modülü Giriş	YP1
Yatay Pano Modülü Çıkış	YP2
Sonlandırma Modülü	S2
Yatay Askı Dikey Modülü (50x50 Köşebent)	YLD
Yatay Askı Dikey Modülü (50x50 Köşebent)	YLY
Yatay Askı Yatay (U) Profil Modülü	YUP
Yatay Tavan Bağlantı Kiti	YTK
Flexible Bağlantı Barası	FB
Pano Körüklü Flans	PKF
Yatay Askı Dikey Uygulama (NPI80)	YID
Yatay Askı Yatay Uygulama (NPI80)	YIY
Tavan Askı NPI	IYD

Standart Boy



Feeder Busbar	FS

ÖRNEK SİPARİŞ

1600 A Alüminyum,
Feeder IP 55 4 İletken

HP-KA165T2FS

FEEDER BUSBAR

Güç iletiminde direk beslemeyi sağlar. Bolt-on üzerinden enerji alınabilir. Standart üretim 3000 mm, istek üzerine minimum 500 mm den başlayan farklı ölçülerde imal edilebilir.

Plug-in Busbar	PS

ÖRNEK SİPARİŞ

1250 A Alüminyum,
Plug-in IP 55 4 İletken

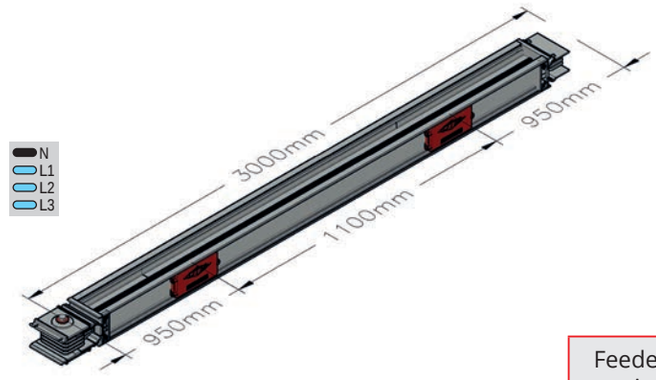
HP-KA125T2PS

PLUG-IN BUSBAR

Plug-in Boylarda standart üretim 2 çıkışlı istek üzerine çıkış sayısı değiştirilebilir.

Plug-in busbarların; ek noktalarından 1000 A'e kadar bolt-on çıkış kutuları ile prizlerinden 630 A'e kadar Plug-in çıkış kutuları ile akım alınabilir.

Bilgi: Lütfen Plug-in busbar siparişlerinizde akım alma pencere sayısını,tek veya çift yön olup olmadığını belirtiniz.



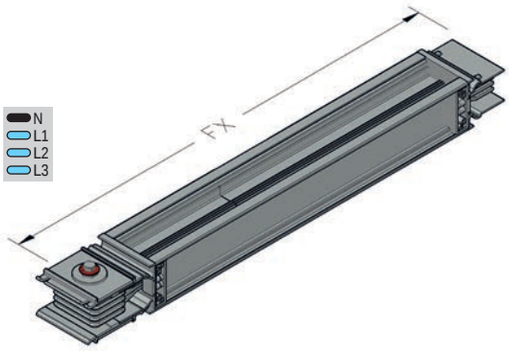
Feeder Busbar Ara Boy	FX

ÖRNEK SİPARİŞ

2000 A Alüminyum,
Feeder IP 55 4 İletken

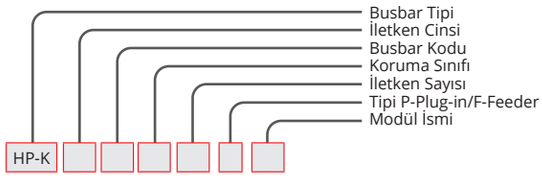
HP-KA205T2FX

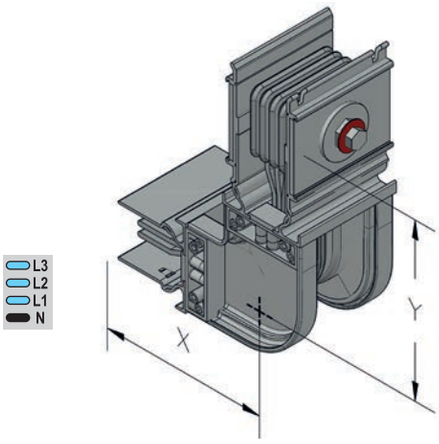
Bilgi:
Feeder Minimum Ara boy = 50 cm
Plug-in Minimum Ara boy =100 cm



Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Dönüş Modülleri





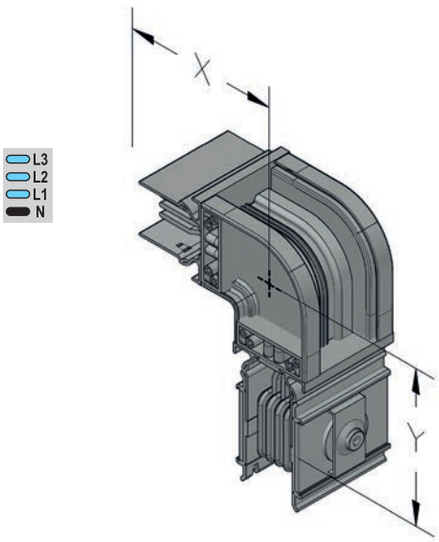
Dikey Dirsek Yukarı Dönüş	DDU

ÖRNEK SİPARİŞ

800 A Alüminyum,
Dirsek IP 55 4 İletken

HP-KA085T2FDDU

DİKEY DİRSEK					
Busbar boylarının dikey montajlarında aşağı ve yukarı dönüşlerde kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	230	230	550A	230	230
500A	230	230	650A	230	230
630A	230	230	800A	230	230
800A	230	230	1000A	230	230
1000A	230	230	1250A	230	230
1250A	230	230	1350A	230	230
1350A	230	230	1600A	230	230
1600A	230	230	2000A	230	230
2000A	230	230	2250A	230	230
2500A	230	230	2500A	230	230
2500A	230	230	2000A	230	230
3000A	230	230	2500A	230	230
3200A	230	230	3300A	230	230
4000A	230	230	3600A	230	230
5000A	230	230	4000A	230	230
6300A	230	230	4250A	230	230
			5000A	230	230
			6300A	230	230

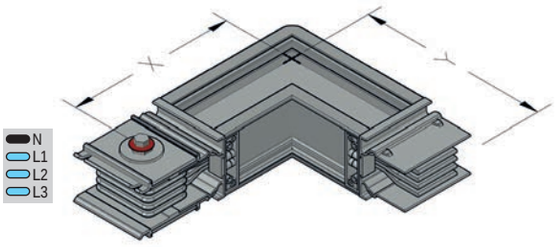


Dikey Dirsek Aşağı Dönüş	DDD

ÖRNEK SİPARİŞ

3200 A Alüminyum,
Dirsek IP 55 4 İletken

HP-KA325T2FDDD

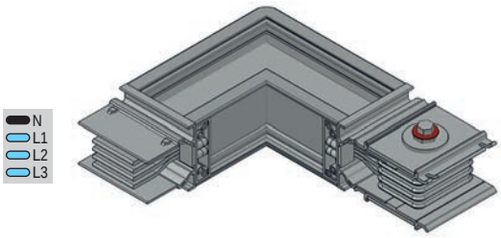


Yatay Dirsek Sola Dönüş	YDL

ÖRNEK SİPARİŞ

4000 A Alüminyum,
Dirsek IP 55 4 İletken

HP-KA405T2FYDL



Yatay Dirsek Sağa Dönüş	YDR

ÖRNEK SİPARİŞ

800 A Alüminyum,
Dirsek IP 55 4 İletken

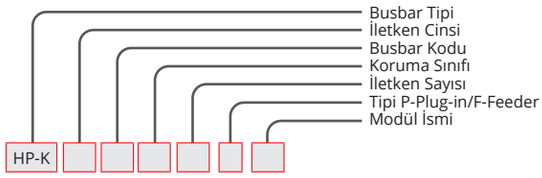
HP-KA085T2FYDR

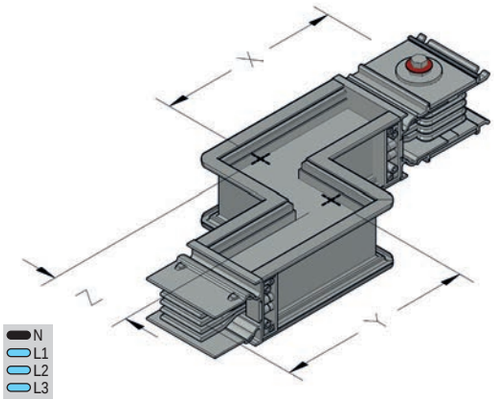
YATAY DİRSEK					
Busbar boylarının yatay montajında sağ ve sol dönüşlerde kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	250	250	550A	250	250
500A	250	250	650A	250	250
630A	250	250	800A	250	250
800A	257	257	1000A	257	257
1000A	270	270	1250A	265	265
1250A	285	285	1350A	270	270
1350A	292	292	1600A	277	277
1600A	310	310	2000A	292	292
2000A	330	330	2250A	310	310
2500A	355	355	2500A	330	330
2500A	363	363	2000A	308	308
3000A	393	393	2500A	323	323
3200A	413	413	3300A	363	363
4000A	453	453	3600A	378	378
5000A	503	503	4000A	393	393
6300A	578	578	4250A	413	413
			5000A	453	453
			6300A	516	516

HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Dönüş Modülleri



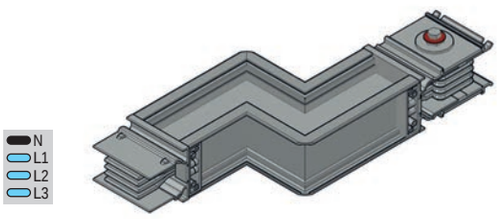


Çift Yatay Dirsek Sola (Kombine Off-set)	YOL

ÖRNEK SİPARİŞ

1000 A Alüminyum,
Ofset IP 55 4 İletken

HP-KA105T2FYOL



Çift Yatay Dirsek Sağa (Kombine Off-set)	YOR

ÖRNEK SİPARİŞ

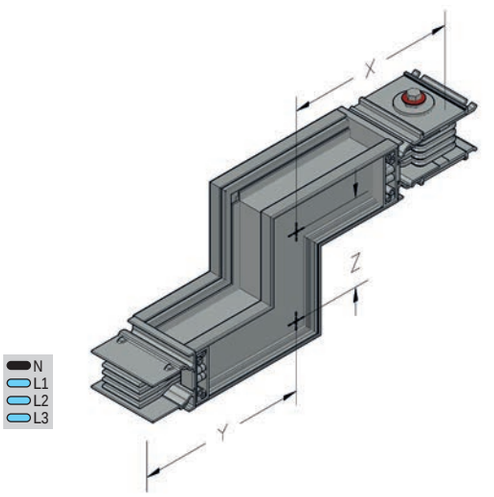
1600 A Alüminyum,
Ofset IP 55 4 İletken

HP-KA165T2FYOR

ÇİFT YATAY DİRSEK (OFF-SET)

Busbar boylarının yatay montajında sağ sol çıkıntılı dönüşlerde kullanılır.

(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	250	250	202	550A	250	250	202
500A	250	250	202	650A	250	250	202
630A	250	250	202	800A	250	250	202
800A	257	257	217	1000A	257	257	217
1000A	270	270	242	1250A	265	265	232
1250A	285	285	272	1350A	270	270	242
1350A	292	292	287	1600A	277	277	257
1600A	310	310	322	2000A	292	292	287
2000A	330	330	362	2250A	310	310	322
2500A	355	355	412	2500A	330	330	362
2500A	363	363	429	2000A	308	308	318
3000A	393	393	489	2500A	323	323	348
3200A	413	413	529	3300A	363	363	428
4000A	453	453	609	3600A	378	378	458
5000A	503	503	706	4000A	393	393	488
6300A	578	578	857	4250A	413	413	528
				5000A	453	453	608
				6300A	516	516	735

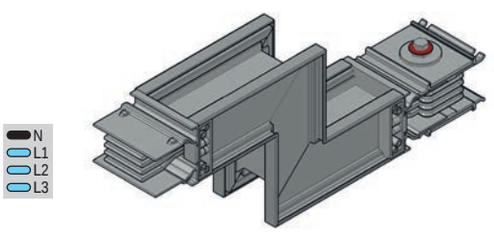


Çift Dikey Dirsek Yukarı (Kombine Off-set)	DOU

ÖRNEK SİPARİŞ

2500 A Alüminyum,
Ofset IP 55 4 İletken

HP-KA255T2FDOU



Çift Dikey Dirsek Aşağı (Kombine Off-set)	DOD

ÖRNEK SİPARİŞ

3000 A Alüminyum,
Ofset IP 55 4 İletken

HP-KA305T2FDOD

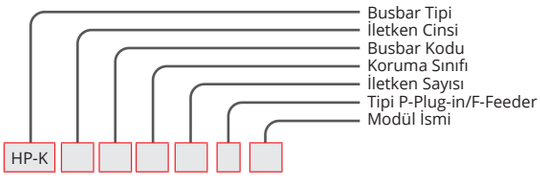
ÇİFT DİKEY DİRSEK (OFF-SET)

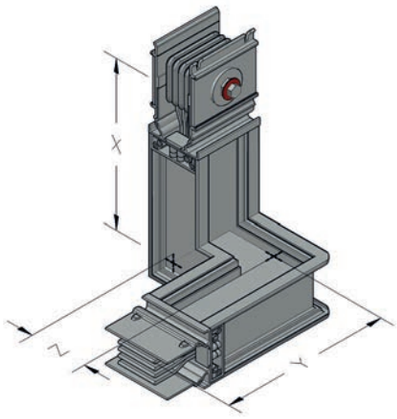
Busbar boylarının dikey montajında aşağı yukarı çıkıntılı dönüşlerde kullanılır.

(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	230	230	230	550A	230	230	230
500A	230	230	230	650A	230	230	230
630A	230	230	230	800A	230	230	230
800A	230	230	230	1000A	230	230	230
1000A	230	230	230	1250A	230	230	230
1250A	230	230	230	1350A	230	230	230
1350A	230	230	230	1600A	230	230	230
1600A	230	230	230	2000A	230	230	230
2000A	230	230	230	2250A	230	230	230
2500A	230	230	230	2500A	230	230	230
2500A	230	230	230	2000A	230	230	230
3000A	230	230	230	2500A	230	230	230
3200A	230	230	230	3300A	230	230	230
4000A	230	230	230	3600A	230	230	230
5000A	230	230	230	4000A	230	230	230
6300A	230	230	230	4250A	230	230	230
				5000A	230	230	230
				6300A	230	230	230

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Dönüş Modülleri





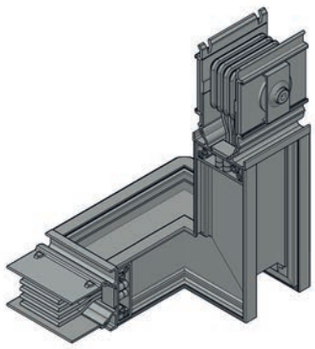
N
L1
L2
L3

Sola Yukarı (Kombine Off-set)	LUK

ÖRNEK SİPARİŞ

1250 A Alüminyum,
Kombine Ofset IP 55 4 İletken

HP-KA125T2FLUK



N
L1
L2
L3

Sağa Yukarı (Kombine Off-set)	RUK

ÖRNEK SİPARİŞ

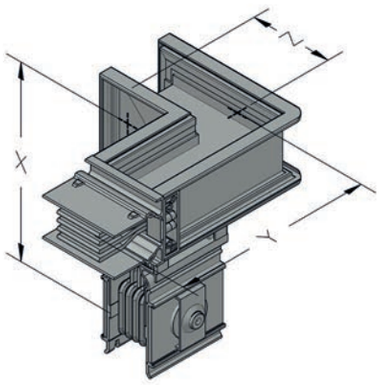
1000 A Alüminyum,
Kombine Ofset IP 55 4 İletken

HP-KA105T2FRUK

SAĞ/SOL YUKARI KOMBİNE (OFF-SET)

Busbar boylarının yatay montajında sağ sol çıkıntılı dönüşlerde kullanılır.

(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	230	250	250	550A	230	250	250
500A	230	250	250	650A	230	250	250
630A	230	250	250	800A	230	250	250
800A	230	257	257	1000A	230	257	257
1000A	230	270	270	1250A	230	265	265
1250A	230	285	285	1350A	230	270	270
1350A	230	292	292	1600A	230	277	277
1600A	230	310	310	2000A	230	292	292
2000A	230	330	330	2250A	230	310	310
2500A	230	355	355	2500A	230	330	330
2500A	230	363	363	2000A	230	308	308
3000A	230	393	393	2500A	230	323	323
3200A	230	413	413	3300A	230	363	363
4000A	230	453	453	3600A	230	378	378
5000A	230	503	503	4000A	230	393	393
6300A	230	578	578	4250A	230	413	413
				5000A	230	453	453
				6300A	230	516	516



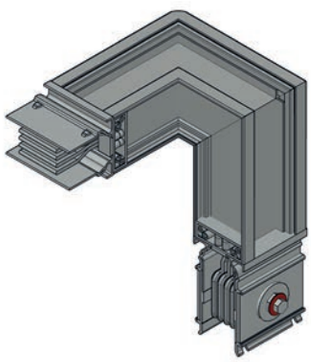
N
L1
L2
L3

Sola Aşağı (Kombine Off-set)	LDK

ÖRNEK SİPARİŞ

1600 A Alüminyum,
Kombine Ofset IP 55 4 İletken

HP-KA165T2FLDK



N
L1
L2
L3

Sağa Aşağı (Kombine Off-set)	RDK

ÖRNEK SİPARİŞ

1350 A Alüminyum,
Kombine Ofset IP 55 4 İletken

HP-KA145T2FRDK

SAĞ/SOL AŞAGI KOMBİNE (OFF-SET)

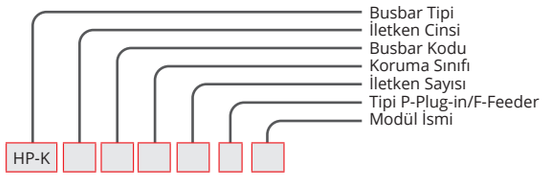
Busbar boylarının yataydan dikeye dönüşümlerinde sağ ve sol olarak kullanılır.

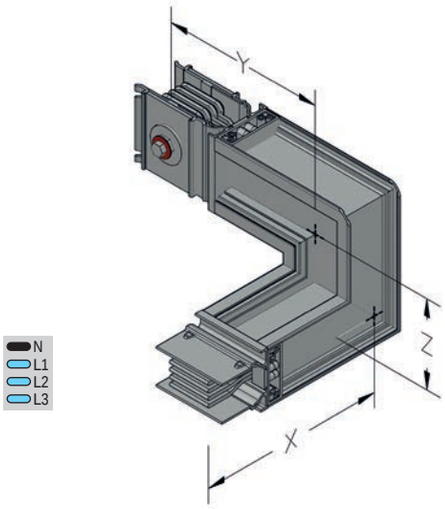
(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	230	250	250	550A	230	250	250
500A	230	250	250	650A	230	250	250
630A	230	250	250	800A	230	250	250
800A	230	257	257	1000A	230	257	257
1000A	230	270	270	1250A	230	265	265
1250A	230	285	285	1350A	230	270	270
1350A	230	292	292	1600A	230	277	277
1600A	230	310	310	2000A	230	292	292
2000A	230	330	330	2250A	230	310	310
2500A	230	355	355	2500A	230	330	330
2500A	230	363	363	2000A	230	308	308
3000A	230	393	393	2500A	230	323	323
3200A	230	413	413	3300A	230	363	363
4000A	230	453	453	3600A	230	378	378
5000A	230	503	503	4000A	230	393	393
6300A	230	578	578	4250A	230	413	413
				5000A	230	453	453
				6300A	230	516	516

HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Dönüş Modülleri



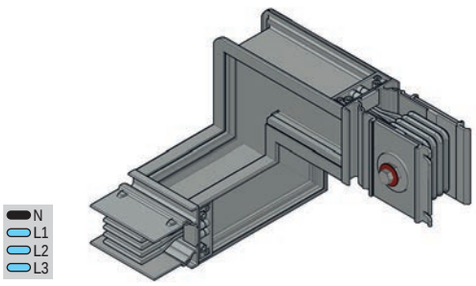


Yukarı Sola (Kombine Off-set)	ULK

ÖRNEK SİPARİŞ

2000 A Bakır
Kombine Ofset IP 55 4 İletken

HP-KC215T2FULK



Yukarı Sağa (Kombine Off-set)	URK

ÖRNEK SİPARİŞ

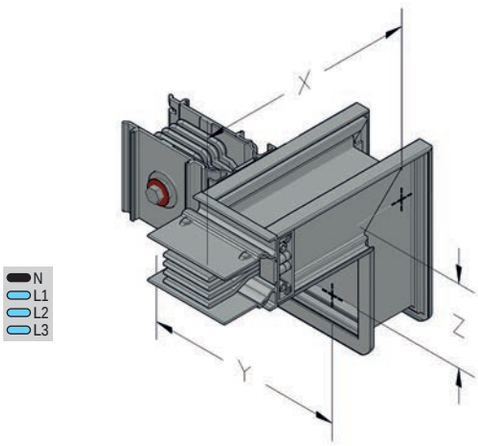
1250 A Bakır
Kombine Ofset IP 55 4 İletken

HP-KC135T2FURK

YUKARI SAĞ/SOL KOMBİNE (OFF-SET)

Busbar boylarının yataydan dikeye dönüşümlerinde sağ ve sol olarak kullanılır.

(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	230	250	250	550A	230	250	250
500A	230	250	250	650A	230	250	250
630A	230	250	250	800A	230	250	250
800A	230	257	257	1000A	230	257	257
1000A	230	270	270	1250A	230	265	265
1250A	230	285	285	1350A	230	270	270
1350A	230	292	292	1600A	230	277	277
1600A	230	310	310	2000A	230	292	292
2000A	230	330	330	2250A	230	310	310
2500A	230	355	355	2500A	230	330	330
2500A	230	363	363	2000A	230	308	308
3000A	230	393	393	2500A	230	323	323
3200A	230	413	413	3300A	230	363	363
4000A	230	453	453	3600A	230	378	378
5000A	230	503	503	4000A	230	393	393
6300A	230	578	578	4250A	230	413	413
				5000A	230	453	453
				6300A	230	516	516

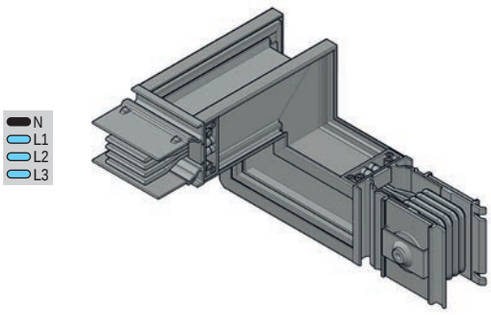


Aşağı Sola (Kombine Off-set)	DLK

ÖRNEK SİPARİŞ

1600 A Bakır
Kombine Ofset IP 55 4 İletken

HP-KC175T2FDLK



Aşağı Sağa (Kombine Off-set)	DRK

ÖRNEK SİPARİŞ

1250 A Alüminyum,
Kombine Ofset IP 55 4 İletken

HP-KA125T2FDRK

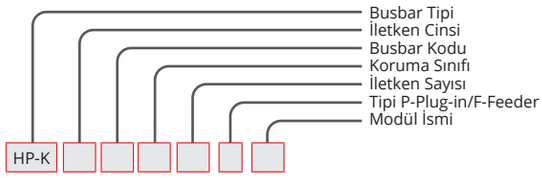
AŞAGI SAĞ/SOL KOMBİNE (OFF-SET)

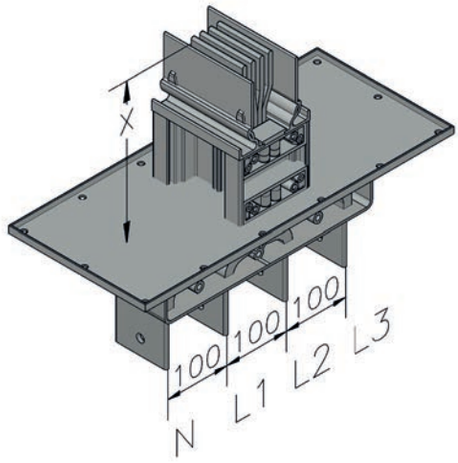
Busbar boylarının yataydan dikeye dönüşümlerinde sağ ve sol olarak kullanılır.

(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	230	250	250	550A	230	250	250
500A	230	250	250	650A	230	250	250
630A	230	250	250	800A	230	250	250
800A	230	257	257	1000A	230	257	257
1000A	230	270	270	1250A	230	265	265
1250A	230	285	285	1350A	230	270	270
1350A	230	292	292	1600A	230	277	277
1600A	230	310	310	2000A	230	292	292
2000A	230	330	330	2250A	230	310	310
2500A	230	355	355	2500A	230	330	330
2500A	230	363	363	2000A	230	308	308
3000A	230	393	393	2500A	230	323	323
3200A	230	413	413	3300A	230	363	363
4000A	230	453	453	3600A	230	378	378
5000A	230	503	503	4000A	230	393	393
6300A	230	578	578	4250A	230	413	413
				5000A	230	453	453
				6300A	230	516	516

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Pano Modülleri





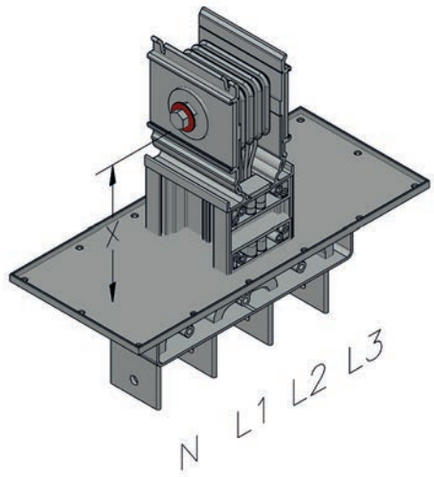
Dikey Pano Modülü Pano Giriş	PME

ÖRNEK SİPARİŞ

1000 A Alüminyum,
Pano Modülü IP 55 4 İletken

HP-KA105T2FPME

DİKEY PANO MODÜLÜ			
Düz boyların panoya bağlanmasında kullanılır.			
(AL)		(CU)	
AMR.	X mm	AMR.	X mm
400A	220	550A	220
500A	220	650A	220
630A	220	800A	220
800A	220	1000A	220
1000A	220	1250A	220
1250A	220	1350A	220
1350A	220	1600A	220
1600A	220	2000A	220
2000A	220	2250A	220
2500A	220	2500A	220
2500A	220	2000A	220
3000A	220	2500A	220
3200A	220	3300A	220
4000A	220	3600A	220
5000A	220	4000A	220
6300A	220	4250A	220
		5000A	220
		6300A	220

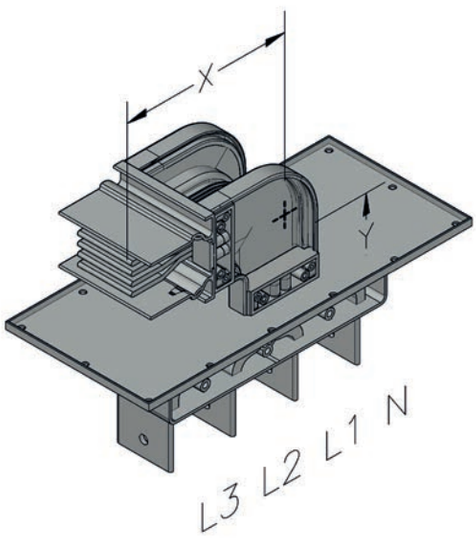


Dikey Pano Modülü Pano Çıkış	PMD

ÖRNEK SİPARİŞ

1250 A Alüminyum,
Pano Modülü IP 55 4 İletken

HP-KA125T2FPMD



Dikey Pano Modülü Yukarı Pano Giriş	PM1

ÖRNEK SİPARİŞ

800 A Bakır
Pano Modülü IP 55 4 İletken

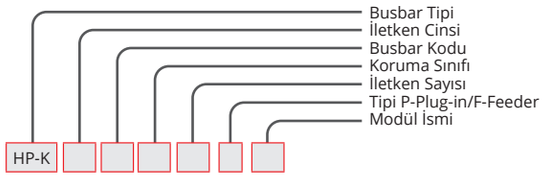
HP-KC075T2FPM1

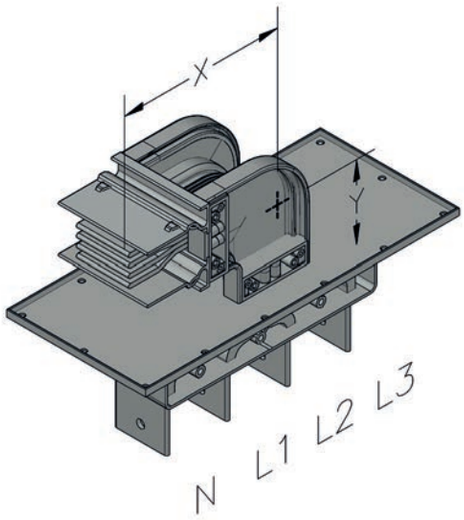
YUKARI PANO MODÜLÜ					
Düz boyların panoya bağlanmasında kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	230	230	550A	230	230
500A	230	230	650A	230	230
630A	230	230	800A	230	230
800A	230	230	1000A	230	230
1000A	230	230	1250A	230	230
1250A	230	230	1350A	230	230
1350A	230	230	1600A	230	230
1600A	230	230	2000A	230	230
2000A	230	230	2250A	230	230
2500A	230	230	2500A	230	230
2500A	230	230	2000A	230	230
3000A	230	230	2500A	230	230
3200A	230	230	3300A	230	230
4000A	230	230	3600A	230	230
5000A	230	230	4000A	230	230
6300A	230	230	4250A	230	230
			5000A	230	230
			6300A	230	230

HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Pano Modülleri



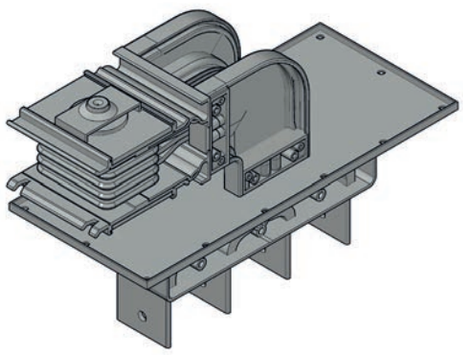


Dikey Pano Modülü Aşağı Pano Giriş	PM2

ÖRNEK SİPARİŞ

3200 A Alüminyum,
Pano Modülü IP 55 4 İletken

HP-KA325T2FPM2

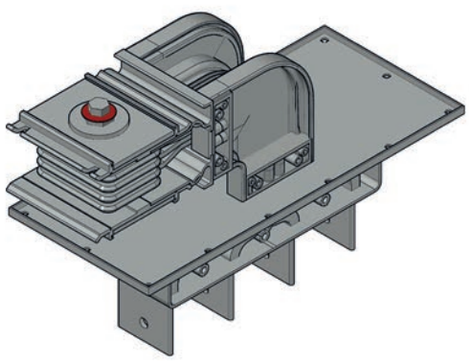


Dikey Pano Modülü Yukarı Pano Çıkış	PM3

ÖRNEK SİPARİŞ

4000 A Alüminyum,
Pano Modülü IP 55 4 İletken

HP-KA405T2FPM3



Dikey Pano Modülü Aşağı Pano Çıkış	PM4

ÖRNEK SİPARİŞ

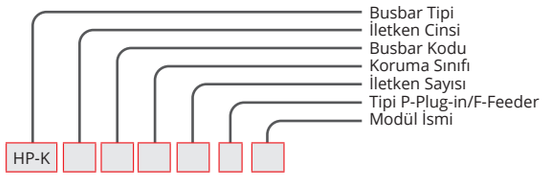
1000 A Alüminyum,
Pano Modülü IP 55 4 İletken

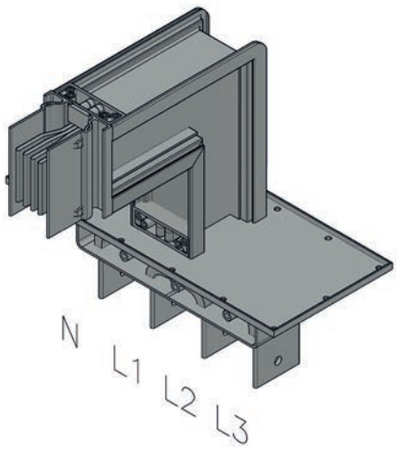
HP-KA105T2FPM4

AŞAĞI PANO MODÜLÜ					
Düz boyların panoya bağlanmasında kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	230	230	550A	230	230
500A	230	230	650A	230	230
630A	230	230	800A	230	230
800A	230	230	1000A	230	230
1000A	230	230	1250A	230	230
1250A	230	230	1350A	230	230
1350A	230	230	1600A	230	230
1600A	230	230	2000A	230	230
2000A	230	230	2250A	230	230
2500A	230	230	2500A	230	230
2500A	230	230	2000A	230	230
3000A	230	230	2500A	230	230
3200A	230	230	3300A	230	230
4000A	230	230	3600A	230	230
5000A	230	230	4000A	230	230
6300A	230	230	4250A	230	230
			5000A	230	230
			6300A	230	230

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Pano Modülleri



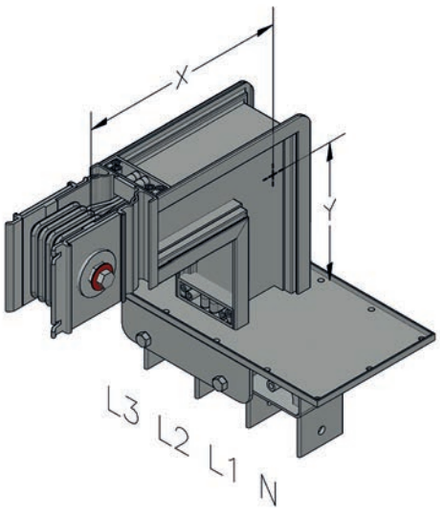


Yatay Pano Modülü Sağa Pano Giriş	PM5

ÖRNEK SİPARİŞ

2500 A Bakır
Pano Modülü IP 55 4 İletken

HP-KC275T2FPM5

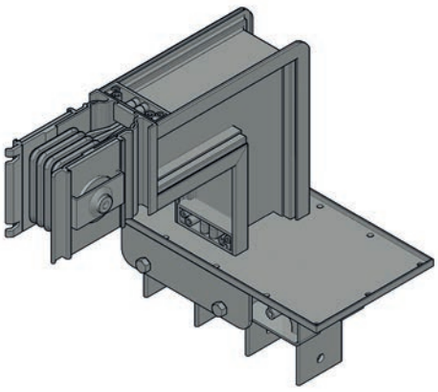


Yatay Pano Modülü Sola Pano Çıkış	PM6

ÖRNEK SİPARİŞ

1600 A Bakır
Pano Modülü IP 55 4 İletken

HP-KC175T2FPM6



Yatay Pano Modülü Sağa Pano Çıkış	PM7

ÖRNEK SİPARİŞ

800 A Bakır
Pano Modülü IP 55 4 İletken

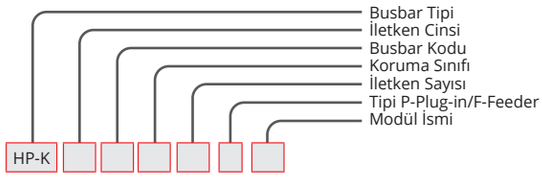
HP-KC075T2FPM7

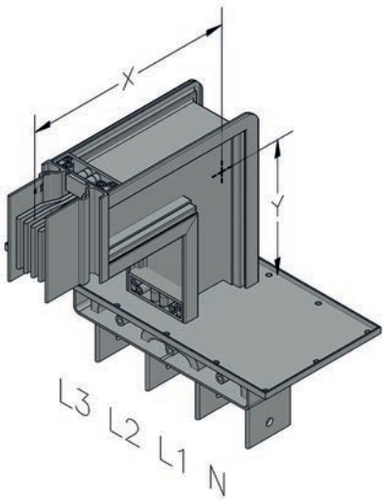
YATAY PANO MODÜLÜ (SAĞ/SOL)					
Düz boyların panoya bağlanmasında kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	250	250	550A	250	250
500A	250	250	650A	250	250
630A	250	250	800A	250	250
800A	257	257	1000A	257	257
1000A	270	270	1250A	265	265
1250A	285	285	1350A	270	270
1350A	292	292	1600A	277	277
1600A	310	310	2000A	292	292
2000A	330	330	2250A	310	310
2500A	355	355	2500A	330	330
2500A	363	363	2000A	308	308
3000A	393	393	2500A	323	323
3200A	413	413	3300A	363	363
4000A	453	453	3600A	378	378
5000A	503	503	4000A	393	393
6300A	578	578	4250A	413	413
			5000A	453	453
			6300A	516	516

HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Pano Modülleri



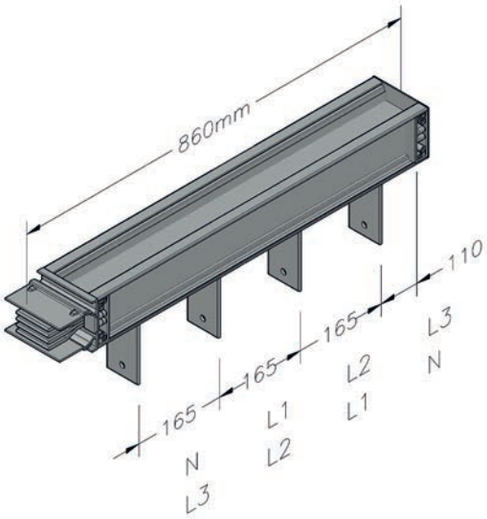


Yatay Pano Modülü Sola Pano Giriş	PM8

ÖRNEK SİPARİŞ

2000 A Alüminyum
Pano Modülü IP 55 4 İletken

HP-KA205T2FPM8

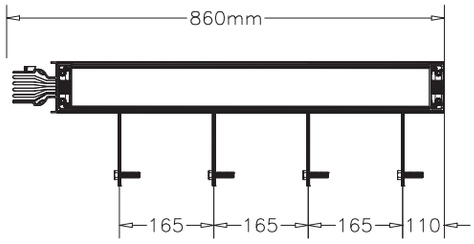


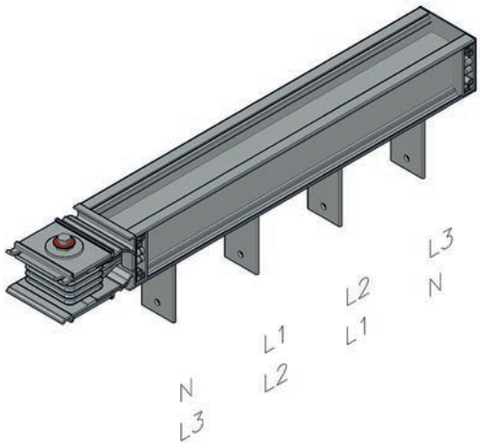
Yatay Pano Modülü Giriş	YP1

ÖRNEK SİPARİŞ

3300 A Bakır
Pano Modülü IP 55 4 İletken

HP-KC335T2FYP1



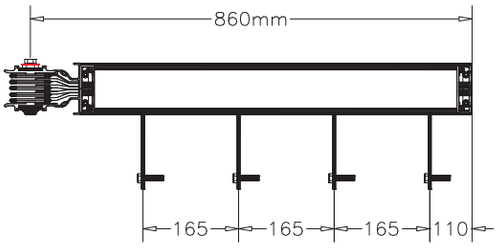


Yatay Pano Modülü Çıkış	YP2

ÖRNEK SİPARİŞ

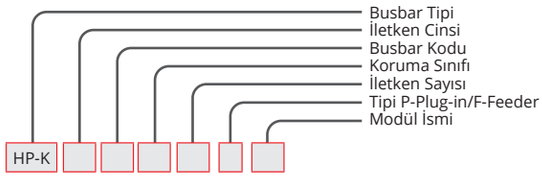
4000 A Bakır
Pano Modülü IP 55 4 İletken

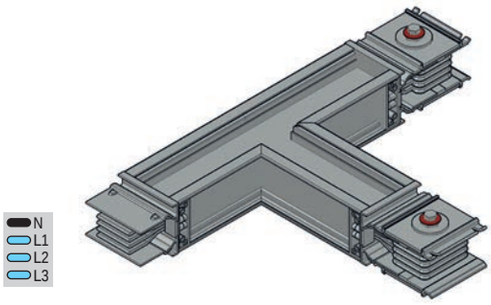
HP-KC415T2FYP2



Özel ölçüdeki modüller için lütfen firmamızı arayınız.

TE Modüller





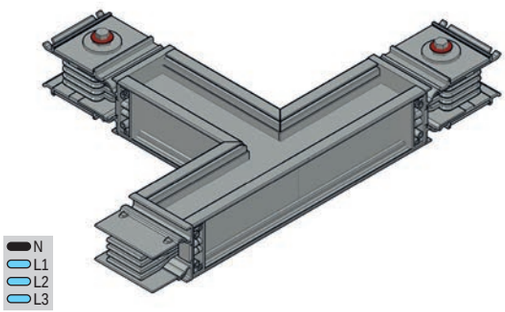
Sağa (T) Modülü	RT

ÖRNEK SİPARİŞ

1350 A Bakır

Te Modüllü IP 55 4 İletken

HP-KC155T2FRT



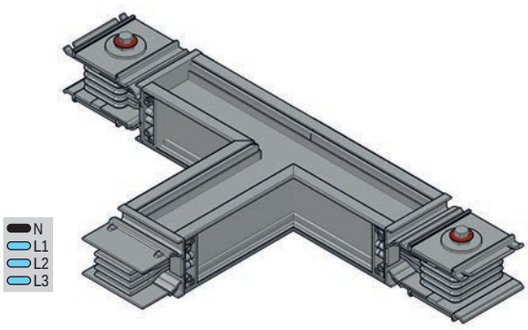
Sola (T) Modülü	LT

ÖRNEK SİPARİŞ

1000 A Alüminyum

Te Modüllü IP 55 4 İletken

HP-KA105T2FLT



Ortadan (T) Modülü	OT

ÖRNEK SİPARİŞ

1250 A Alüminyum

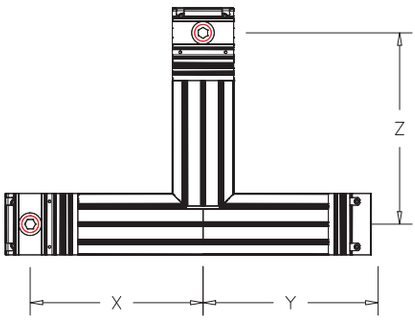
Te Modüllü IP 55 4 İletken

HP-KA125T2FOT

YATAY (TE) SAĞA/SOLA

Busbar boylarının yatay sağ ve sola devam eden hattın (TE) almada kullanılır.

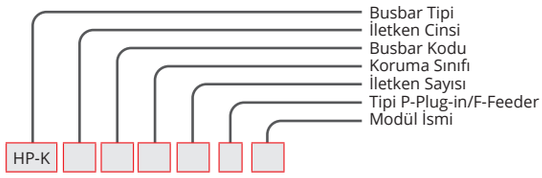
(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	250	250	250	550A	250	250	250
500A	250	250	250	650A	250	250	250
630A	250	250	250	800A	250	250	250
800A	257	257	257	1000A	257	257	257
1000A	270	270	270	1250A	265	265	265
1250A	285	285	285	1350A	270	270	270
1350A	292	292	292	1600A	277	277	277
1600A	310	310	310	2000A	292	292	292
2000A	330	330	330	2250A	310	310	310
2500A	355	355	355	2500A	330	330	330
2500A	363	363	363	2000A	308	308	308
3000A	393	393	393	2500A	323	323	323
3200A	413	413	413	3300A	363	363	363
4000A	453	453	453	3600A	378	378	378
5000A	503	503	503	4000A	393	393	393
6300A	578	578	578	4250A	413	413	413
				5000A	453	453	453
				6300A	516	516	516

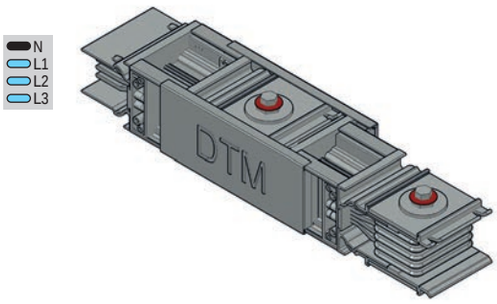


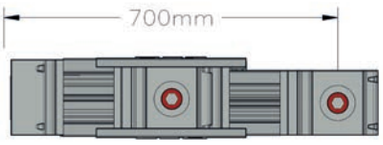
HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Standart Modüller







Redüksiyon Modülü 700 mm	RD

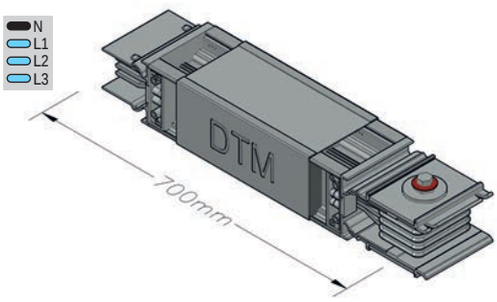
ÖRNEK SİPARİŞ

800 A Alüminyum,
Redüksiyon IP 55 4 İletken

HP-KA085T2FRD

Redüksiyon Modülü İndirgenme Tablosu

HP-K AL İLETKENLİ														
Alma Akımı	Düşülen Akım Busbar Kodu													
	04	05	06	08	10	12	14	16	20	25	26	30	32	40
500	✓	-	-	-	-	-	-	-	-	-	-	-	-	-
630	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
800	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
1000	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-
1250	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-
1350	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-
1600	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-
2000	-	-	-	-	-	-	✓	✓	-	-	-	-	-	-
2500	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-
2500	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-
3000	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-
3200	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-
4000	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	-
5000	-	-	-	-	-	-	-	-	-	-	-	✓	✓	✓
6300	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓



Genleşme Modülü 700 mm	G

ÖRNEK SİPARİŞ

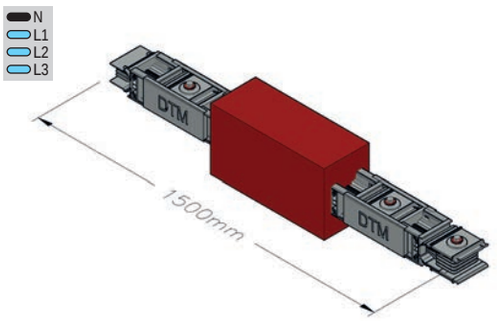
800 A Alüminyum,
Genleşme IP 55 4 İletken

HP-KA085T2FG

Redüksiyon Modülü İndirgenme Tablosu

HP-K CU İLETKENLİ																	
Alma Akımı	Düşülen Akım Busbar Kodu																
	05	06	07	09	13	15	17	21	23	24	22	27	33	36	41	42	51
650	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
800	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1000	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1250	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-
1350	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-
1600	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-
2000	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-	-
2250	-	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	-
2500	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-
2500	-	-	-	-	-	-	-	✓	✓	✓	-	-	-	-	-	-	-
3300	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-
3600	-	-	-	-	-	-	-	-	-	-	✓	✓	✓	-	-	-	-
4000	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-	-
4250	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-	-
5000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	✓	-
6300	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓

Yatay Dilatasyon Bilgisi:
Uzun yatay hatlarda 40 mt bir kullanılır.

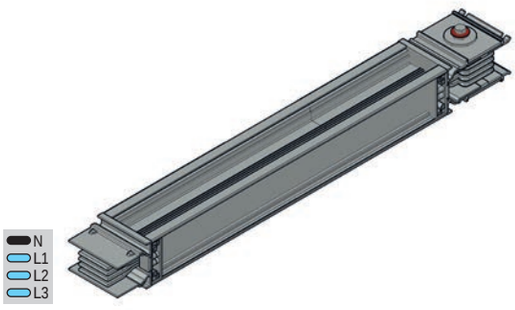


Yatay Dilatasyon Modülü 1500 mm	YD

ÖRNEK SİPARİŞ

1600 A Alüminyum,
Dilatasyon IP 55 4 İletken

HP-KA165T2FYD

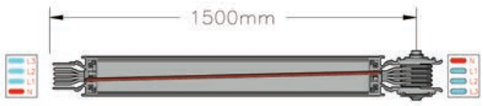


Çaprazlama Modülü 1500 mm	CM

ÖRNEK SİPARİŞ

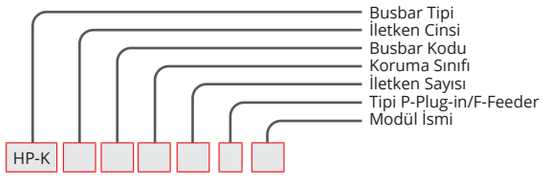
1000 A Alüminyum,
Çaprazlama IP 55 4 İletken

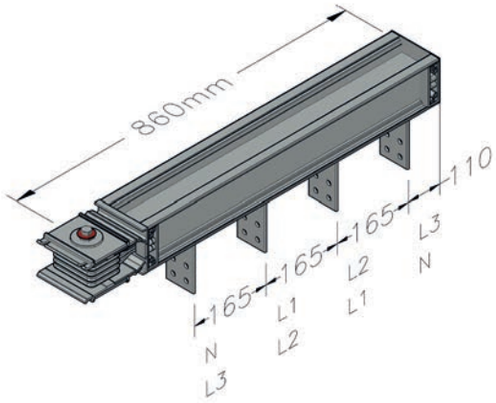
HP-KA105T2FCM



Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Trafo Modülleri



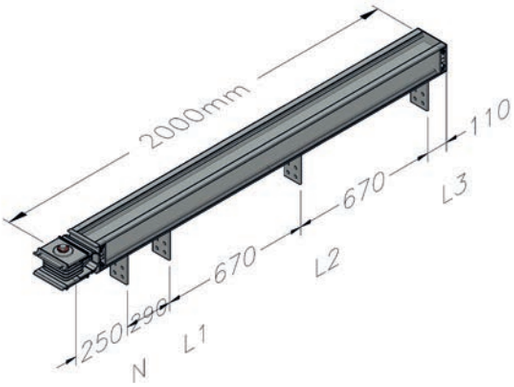


Yatay Trafo Modülü	TMH

ÖRNEK SİPARİŞ

4000 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA405T2FTMH

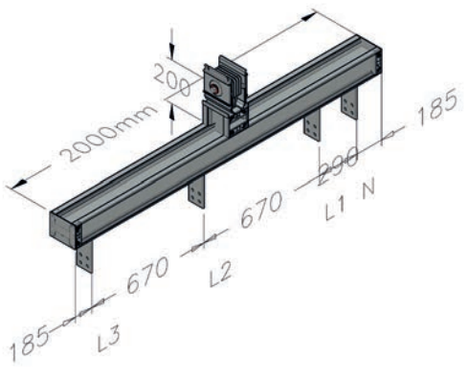


Yatay Trafo Modülü	TMF

ÖRNEK SİPARİŞ

2000 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA205T2FTMF

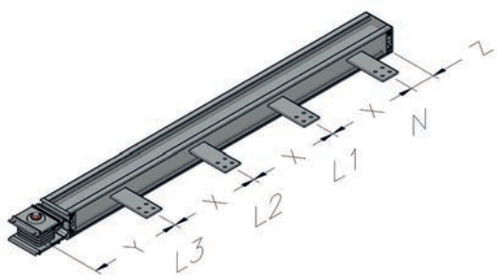


Ortadan Trafo Modülü	TMO

ÖRNEK SİPARİŞ

1600 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA165T2FTMO



Dikey Trafo Modülü	TMK

ÖRNEK SİPARİŞ

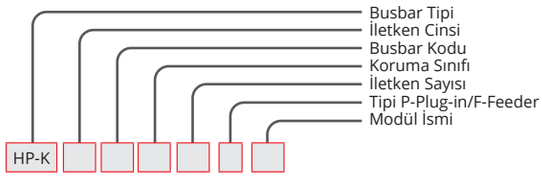
1000 A Alüminyum,
Trafo Modülü IP 55 4 İletken

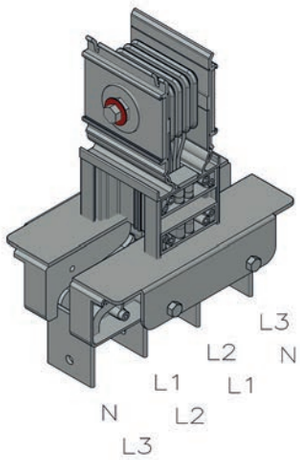
HP-KA105T2FTMK

DİKEY TRAFO MODÜLÜ							
(AL)				(CU)			
AMR.	Y mm	X mm	Z mm	AMR.	Y mm	X mm	Z mm
400A	264	86	124	550A	264	86	124
500A	266	91	126	650A	266	91	126
630A	271	101	131	800A	271	101	131
800A	279	116	139	1000A	279	116	139
1000A	291	141	151	1250A	286	131	146
1250A	306	171	166	1350A	291	141	151
1350A	314	186	174	1600A	299	156	159
1600A	331	221	191	2000A	314	186	174
2000A	351	261	211	2250A	331	221	191
2500A	376	311	236	2500A	351	261	211
2500A	306	171	166	2000A	279	116	139
3000A	321	201	181	2500A	286	131	146
3200A	331	221	191	3300A	306	171	166
4000A	351	261	211	3600A	314	186	174
5000A	376	311	236	4000A	321	201	181
				5000A	351	261	211

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Trafo Modülleri





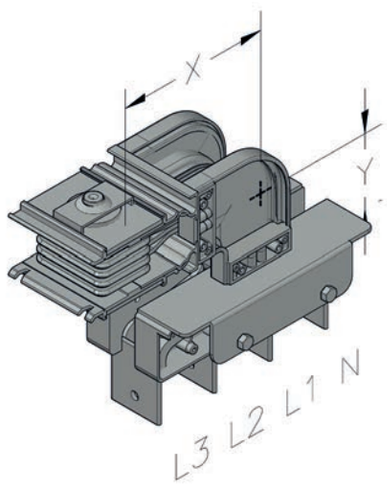
Dikey Trafo Modülü	TR1

ÖRNEK SİPARİŞ

1000 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA105T2FTR1

DİKEY TRAFO MODÜLÜ			
Düz boyların panoya bağlanmasında kullanılır.			
(AL)		(CU)	
AMR.	X mm	AMR.	X mm
400A	220	550A	220
500A	220	650A	220
630A	220	800A	220
800A	220	1000A	220
1000A	220	1250A	220
1250A	220	1350A	220
1350A	220	1600A	220
1600A	220	2000A	220
2000A	220	2250A	220
2500A	220	2500A	220
2500A	220	2000A	220
3000A	220	2500A	220
3200A	220	3300A	220
4000A	220	3600A	220
5000A	220	4000A	220
6300A	220	4250A	220
		5000A	220
		6300A	220



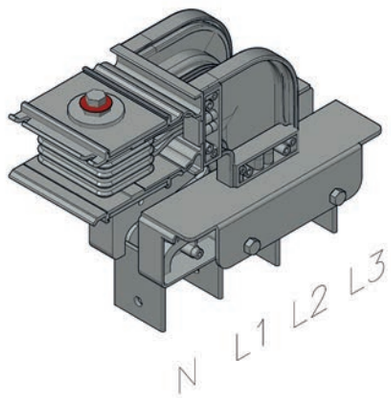
Yukarı Trafo Modülü	TRU

ÖRNEK SİPARİŞ

2500 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA265T2FTRU

YUKARI/AŞAĞI TRAFO MODÜLÜ					
Düz boyların trafoya bağlanmasında kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	230	230	550A	230	230
500A	230	230	650A	230	230
630A	230	230	800A	230	230
800A	230	230	1000A	230	230
1000A	230	230	1250A	230	230
1250A	230	230	1350A	230	230
1350A	230	230	1600A	230	230
1600A	230	230	2000A	230	230
2000A	230	230	2250A	230	230
2500A	230	230	2500A	230	230
2500A	230	230	2000A	230	230
3000A	230	230	2500A	230	230
3200A	230	230	3300A	230	230
4000A	230	230	3600A	230	230
5000A	230	230	4000A	230	230
6300A	230	230	4250A	230	230
			5000A	230	230
			6300A	230	230



Aşağı Trafo Modülü	TRD

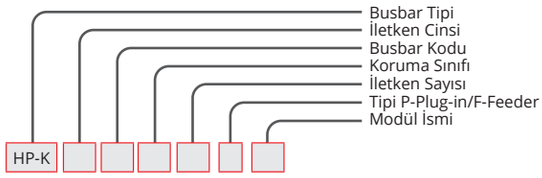
ÖRNEK SİPARİŞ

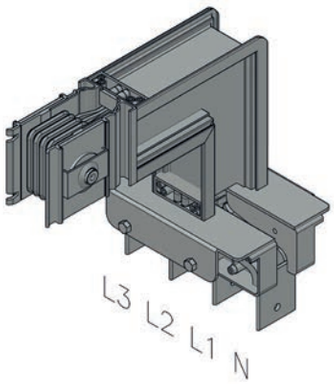
2000 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA205T2FTRD

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Trafo Modülleri



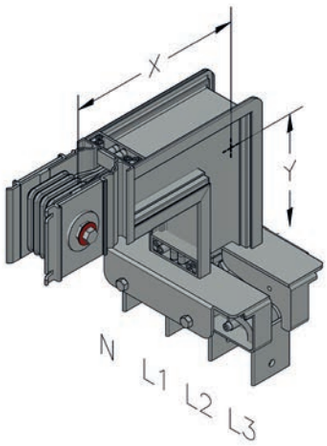


Sağa Trafo Modülü	TRR

ÖRNEK SİPARİŞ

3300 A Bakır
Trafo Modülü IP 55 4 İletken

HP-KC335T2FTRR



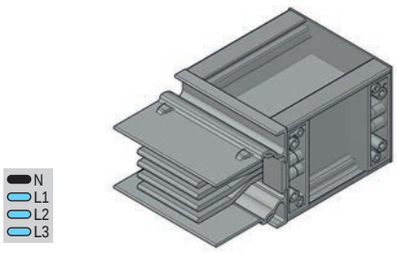
Sola Trafo Modülü	TRL

ÖRNEK SİPARİŞ

1350 A Alüminyum,
Trafo Modülü IP 55 4 İletken

HP-KA145T2FTRL

SAĞA/SOLA TRAFO MODÜLÜ					
Düz boyların trafoya bağlanmasında kullanılır.					
(AL)			(CU)		
AMR.	X mm	Y mm	AMR.	X mm	Y mm
400A	250	250	550A	250	250
500A	250	250	650A	250	250
630A	250	250	800A	250	250
800A	257	257	1000A	257	257
1000A	270	270	1250A	265	265
1250A	285	285	1350A	270	270
1350A	292	292	1600A	277	277
1600A	310	310	2000A	292	292
2000A	330	330	2250A	310	310
2500A	355	355	2500A	330	330
2500A	363	363	2000A	308	308
3000A	393	393	2500A	323	323
3200A	413	413	3300A	363	363
4000A	453	453	3600A	378	378
5000A	503	503	4000A	393	393
6300A	578	578	4250A	413	413
			5000A	453	453
			6300A	516	516

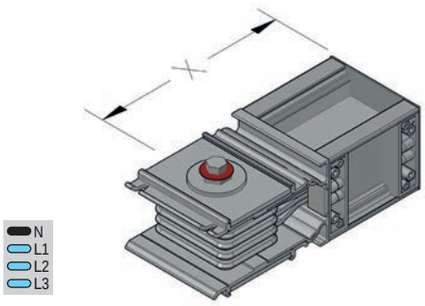


Sonlandırma	S1

ÖRNEK SİPARİŞ

800 A Alüminyum,
Sonlandırma Modülü 55 4 İletken

HP-KA085T2FS1



Sonlandırma	S2

ÖRNEK SİPARİŞ

1000 A Alüminyum,
Sonlandırma Modülü IP 55 4 İletken

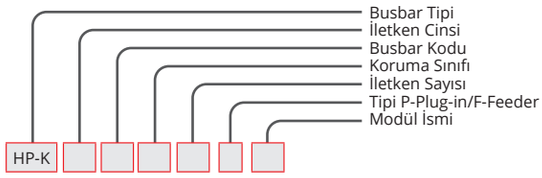
HP-KA105T2FS2

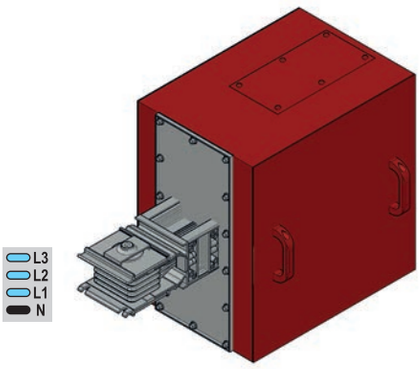
SONLANDIRMA			
Hat sonlarını kapatmakta Kullanılır.			
(AL)		(CU)	
AMR.	X mm	AMR.	X mm
400A	215	550A	215
500A	215	650A	215
630A	215	800A	215
800A	215	1000A	215
1000A	215	1250A	215
1250A	215	1350A	215
1350A	215	1600A	215
1600A	215	2000A	215
2000A	215	2250A	215
2500A	215	2500A	215
2500A	215	2000A	215
3000A	215	2500A	215
3200A	215	3300A	215
4000A	215	3600A	215
5000A	215	4000A	215
6300A	215	4250A	215
		5000A	215
		6300A	215

HP-K

Özel ölçüdeki modüller için lütfen firmamızı arayınız.

Besleme Kutusu



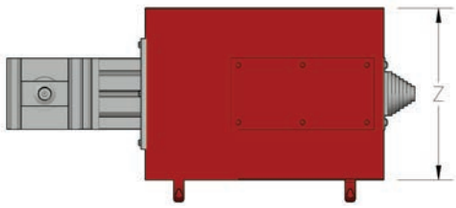


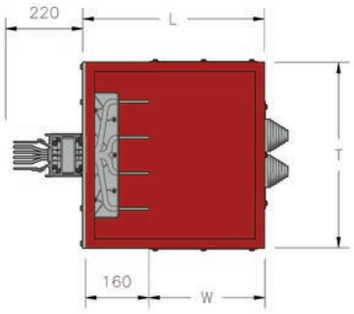
Baştan Besleme Kutusu	BM1

ÖRNEK SİPARİŞ

1350 A Alüminyum,
Besleme IP 55 4 İletken

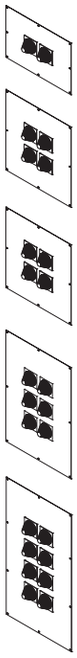
HP-KA145T2R1BM1

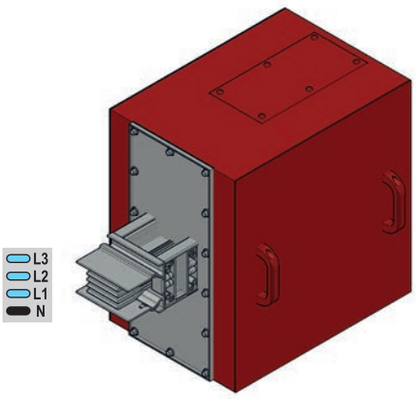




REKOR PLAKALARI			
(AL)		(CU)	
AMR.	Rekor Tipi	AMR.	Rekor Tipi
400A	R1	550A	R1
500A	R1	650A	R1
630A	R1	800A	R1
800A	R1	1000A	R1
1000A	R1	1250A	R1
1250A	R1	1350A	R1
1350A	R2	1600A	R2
1600A	R2	2000A	R2
2000A	R2	2250A	R2
2500A	R3	2500A	R2
2500A	R3	2000A	R2
3000A	R3	2500A	R3
3200A	R3	3300A	R3
4000A	R3	3600A	R3
5000A	R3	4000A	R3
6300A	R4	4250A	R3
		5000A	R3
		6300A	R4

Rekor Tipi





Sondan Besleme Kutusu	BM2

ÖRNEK SİPARİŞ

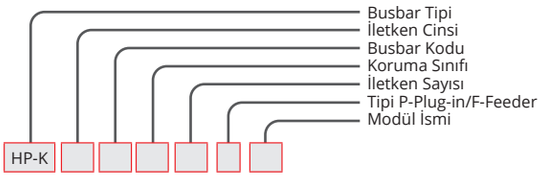
800 A Alüminyum,
Besleme IP 55 4 İletken

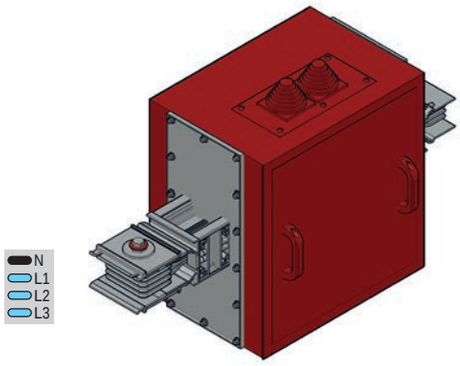
HP-KA085T2R1BM2

YUKARI/AŞAĞI BESLEME MODÜLÜ									
(AL)					(CU)				
AMR.	L mm	T mm	Z mm	W mm	AMR.	L mm	T mm	Z mm	W mm
400A	520	540	360	360	550A	520	540	360	360
500A	520	540	360	360	650A	520	540	360	360
630A	520	540	360	360	800A	520	540	360	360
800A	520	540	360	360	1000A	520	540	360	360
1000A	520	540	360	360	1250A	520	540	360	360
1250A	520	540	360	360	1350A	520	540	360	360
1350A	520	540	560	360	1600A	520	540	360	360
1600A	520	540	560	360	2000A	520	540	560	360
2000A	520	540	560	360	2250A	520	540	560	360
2500A	520	540	560	360	2500A	520	540	560	360
2500A	520	540	560	360	2000A	520	540	560	360
3000A	520	540	560	360	2500A	520	540	560	360
3200A	720	540	780	560	3300A	520	540	560	360
4000A	720	540	780	560	3600A	720	540	560	360
5000A	720	540	780	560	4000A	720	540	780	560
6300A	720	540	1110	560	4250A	720	540	780	560
					5000A	720	540	780	560
					6300A	720	540	960	560

Özel ölçüdeki ve şalter uygulamalı kutular için lütfen arayınız.

Ortadan Besleme



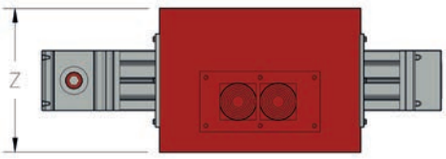


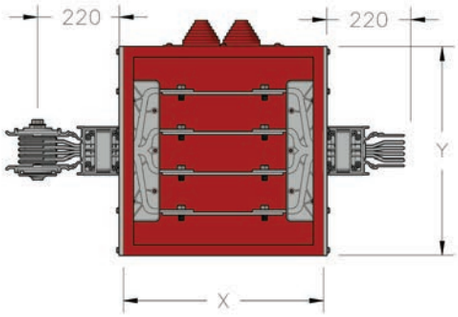
Ortadan Besleme Kutusu	OB

ÖRNEK SİPARİŞ

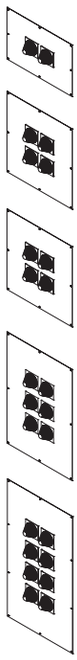
800 A Alüminyum,
Besleme IP 55 4 İletken

HP-KA085T2R1OB





Rekor Tipi

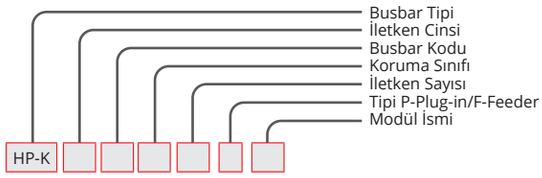


REKOR PLAKALARI			
(AL)		(CU)	
AMR.	Rekor Tipi	AMR.	Rekor Tipi
400A	R1	550A	R1
500A	R1	650A	R1
630A	R1	800A	R1
800A	R1	1000A	R1
1000A	R1	1250A	R1
1250A	R1	1350A	R1
1350A	R2	1600A	R1
1600A	R2	2000A	R2
2000A	R2	2250A	R2
2500A	R3	2500A	R2
2500A	R3	2000A	R2
3000A	R3	2500A	R2
3200A	R3	3300A	R3
4000A	R3	3600A	R3
5000A	R3	4000A	R3
6300A	R4	4250A	R3
		5000A	R3
		6300A	R4

ORTADAN BESLEME							
(AL)				(CU)			
AMR.	X mm	Y mm	Z mm	AMR.	X mm	Y mm	Z mm
400A	520	540	360	550A	520	540	360
500A	520	540	360	650A	520	540	360
630A	520	540	360	800A	520	540	360
800A	520	540	360	1000A	520	540	360
1000A	520	540	360	1250A	520	540	360
1250A	520	540	360	1350A	520	540	360
1350A	520	540	560	1600A	520	540	360
1600A	520	540	560	2000A	520	540	560
2000A	520	540	560	2250A	520	540	560
2500A	520	540	560	2500A	520	540	560
2500A	520	540	560	2000A	520	540	560
3000A	520	540	560	2500A	520	540	560
3200A	720	540	780	3300A	520	540	560
4000A	720	540	780	3600A	720	540	560
5000A	720	540	780	4000A	720	540	780
6300A	720	540	1110	4250A	720	540	780
				5000A	720	540	780
				6300A	720	540	960

Özel ölçüdeki ve şalter uygulamalı kutular için lütfen arayınız.

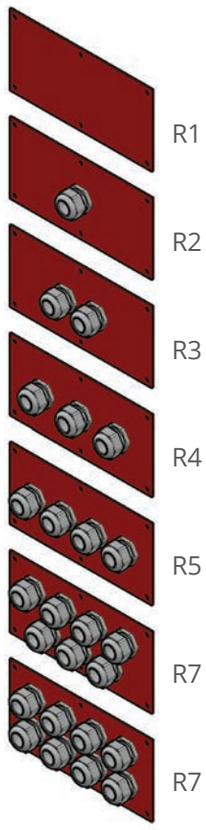
Çıkış Kutusu Kompakt Şalterli Bolt-On



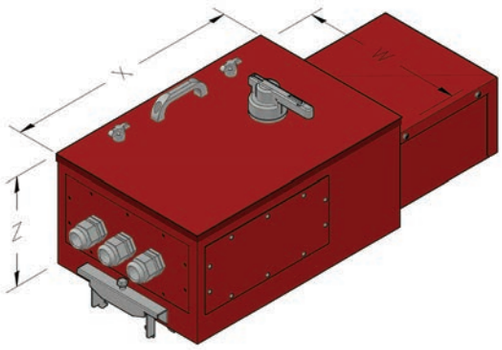
Kompakt Şalterli Bolt-on	HPB

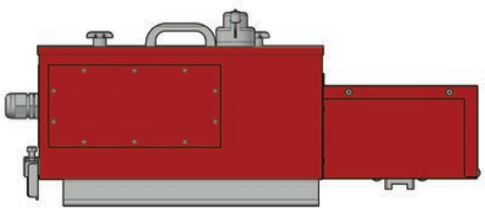
ÖRNEK SİPARİŞ

250 A Çıkış Kutusu Boş
IP 55 4 İletken
HPB255T2R3B



ŞALTER TİPİ KOD	
Şalterli	Boş
S	B

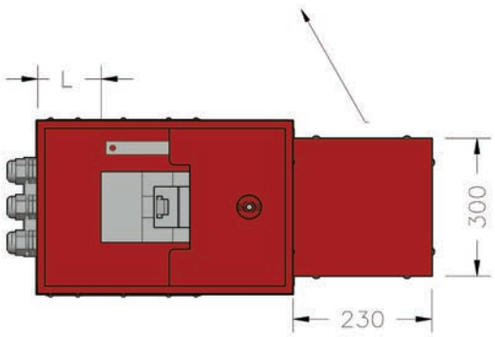




REKOR PLAKALARI	
Rekor Tipi	Kod No
-	R1
RG36X1	R2
RG29X2	R3
RG21X4	R4
RG29X8	R5
RG48X3	R6
RG36X4	R7

HP-K

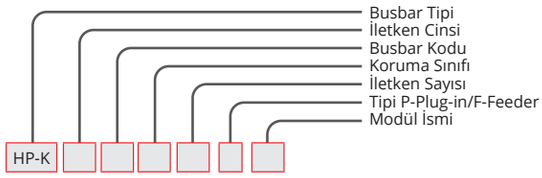
Bilgi:
DTM Bolt-On çıkış kutusu ek blok üzerine ek olarak kutu montajı yerinde teknik şemaya göre yapılmalıdır.



Amp.	Kutu Kodu	X mm	W mm	Z mm	L mm
160	HPB16	560	385	260	150
250	HPB25	560	385	260	150
400	HPB40	560	385	260	200
630	HPB63	560	385	260	200
800	HPB80	710	425	260	250
1000	HPB10	710	425	260	250

Standart dışı kutu için lütfen firmamızı arayınız.

Çıkış Kutusu DTM Mekanizmalı Bolt-On

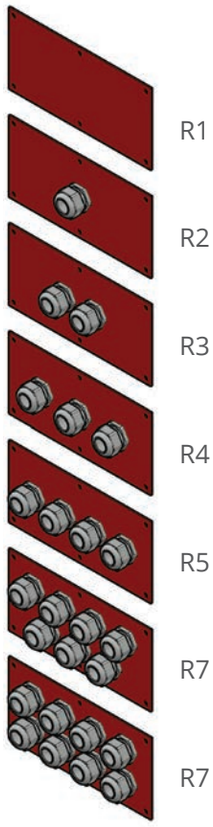


Mekanizmalı Bolt-on	HPM

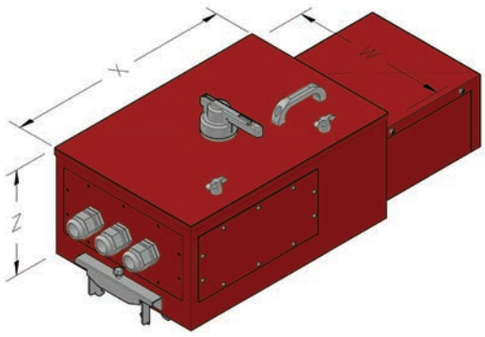
ÖRNEK SİPARİŞ

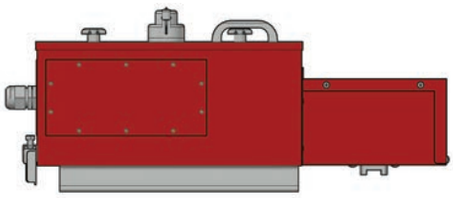
400 A Çıkış Kutusu Boş
IP 55 4 İletken

HPM405T2R4B



ŞALTER TİPİ KOD	
Şalterli	Boş
S	B





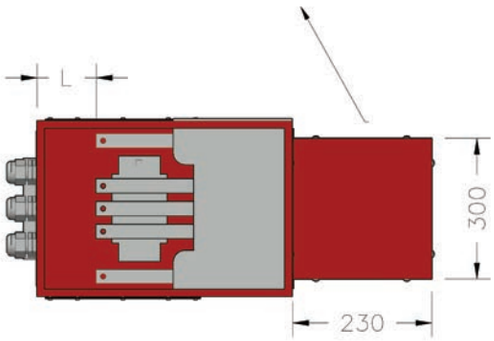
REKOR PLAKALARI	
Rekor Tipi	Kod No
-	R1
RG36X1	R2
RG29X2	R3
RG21X4	R4
RG29X8	R5
RG48X3	R6
RG36X4	R7

HP-K

Amp.	Kutu Kodu	X mm	W mm	Z mm	L mm
160	HPMB16	560	385	260	150
250	HPMB25	560	385	260	150
400	HPMB40	560	385	260	200
630	HPMB63	560	385	260	200

Bilgi:

DTM Bolt-on çıkış kutusu ek blok üzerine ek olarak kutu montajı yerinde teknik şemaya göre yapılmalıdır.



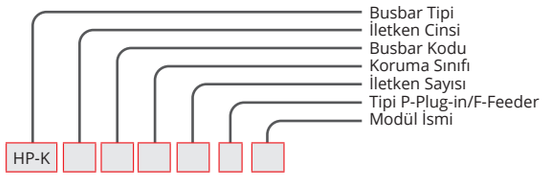
Bilgi:

DTM Bolt-on çıkış kutuları "ON" pozisyonunda mekanik olarak busbara takılamaz ve çıkarılamaz. Kutular "OFF" pozisyonunda iken kutunun enerjisi özel bir mekanizma ile kesilir,aynı mekanizma "ON" pozisyonunda kutuyu enerjilendirir.

Standart mekanizmalı kutular boş olarak teslim edilmektedir.Kutular busbara takılmadan sigortalı yük kesici, sigorta gurubu ya da benzeri bir koruma ünitesinin kutuların içinde yerleştirilmesi gerekmektedir.

Standart dışı kutu için lütfen firmamızı arayınız.

Çıkış Kutusu Kompakt Şalterli Plug-In

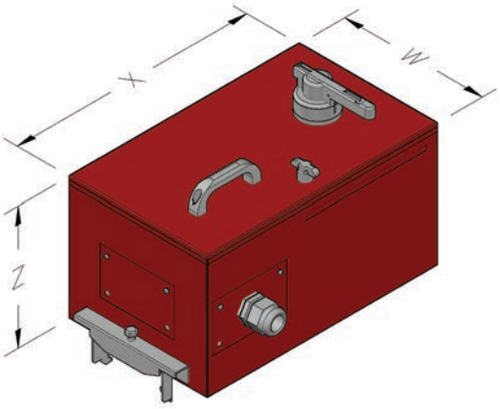


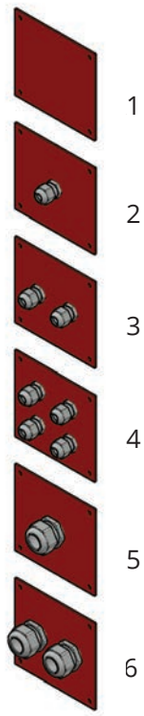
Kompakt Şalterli Plug-in	HPS

ÖRNEK SİPARİŞ

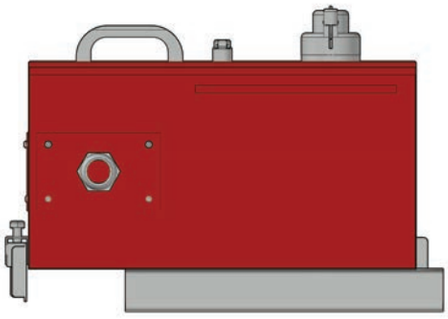
630 A Çıkış Kutusu Şalterli
IP 55 4 İletken

HPS635T2R5S

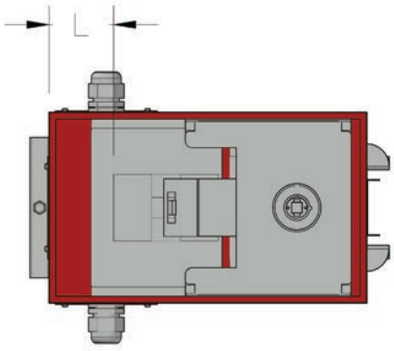




ŞALTER TİPİ KOD	
Şalterli	Boş
S	B



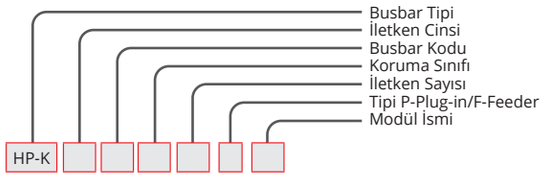
REKOR PLAKALARI	
Rekor Tipi	Kod No
-	R1
RG36X1	R2
RG29X2	R3
RG21X4	R4
RG29X1	R5
RG48X2	R6



Amp.	Kutu Kodu	X mm	W mm	Z mm	L mm
160	HPS16	530	300	220	155
250	HPS25	530	300	220	155
400	HPS40	710	300	220	260
630	HPS63	710	300	220	260

Standart dışı kutu için lütfen firmamızı arayınız.

Çıkış Kutusu DTM Mekanizmalı Plug-In

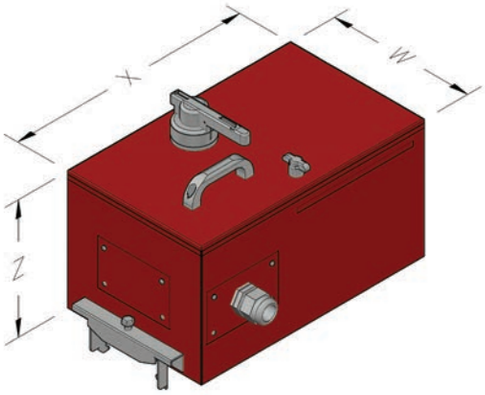


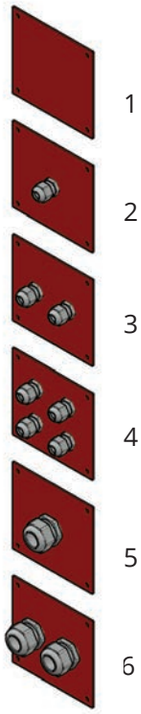
Mekanizmalı Plug-in	HPP

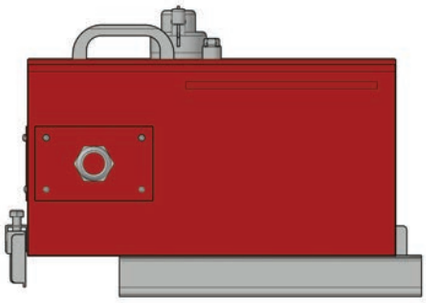
ÖRNEK SİPARİŞ

160 A Çıkış Kutusu Boş
IP 55 4 İletken
HPP165T2R2B

ŞALTER TİPİ KOD	
Şalterli	Boş
S	B



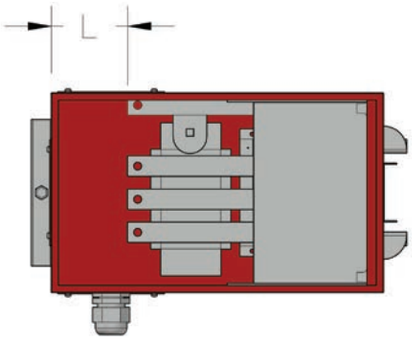




REKOR PLAKALARI	
Rekor Tipi	Kod No
-	R1
RG36X1	R2
RG29X2	R3
RG21X4	R4
RG29X1	R5
RG48X2	R6

HP-K

Amp.	Kutu Kodu	X mm	W mm	Z mm	L mm
160	HPP16	530	300	220	155
250	HPP25	530	300	220	155
400	HPP40	710	300	220	260
500	HPP50	710	300	220	260



Bilgi:

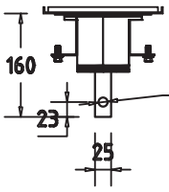
DTM Bolt-on çıkış kutuları"ON" pozisyonunda mekanik olarak busbara takılamaz ve çıkarılamaz. Kutular "OFF" pozisyonunda iken kutunun enerjisi özel bir mekanizma ile kesilir,aynı mekanizma "ON" pozisyonunda kutuyu enerjilendirir.

Standart mekanizmalı kutular boş olarak teslim edilmektedir.Kutular busbara takılmadan sigortalı yük kesici, sigorta gurubu ya da benzeri bir koruma ünitesinin kutuların içinde yerleştirilmesi gerekmektedir.

Standart dışı kutu için lütfen firmamızı arayınız.

Pano Modül Ölçüleri / Alüminyum

400A



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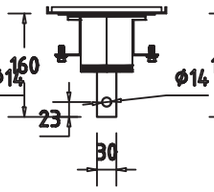

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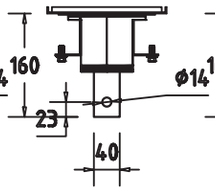

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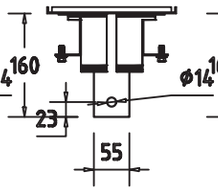

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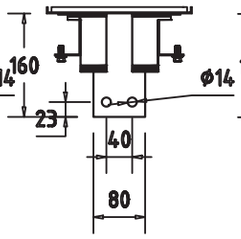

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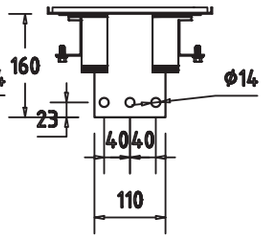

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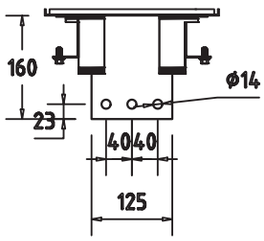

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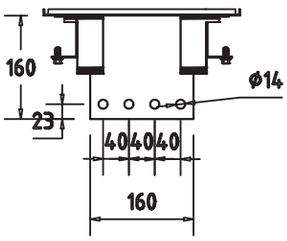

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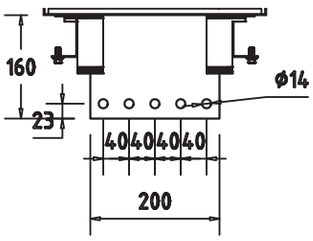

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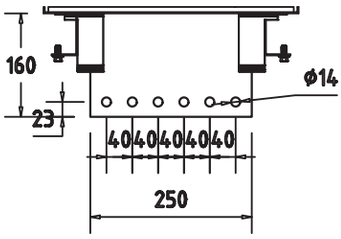

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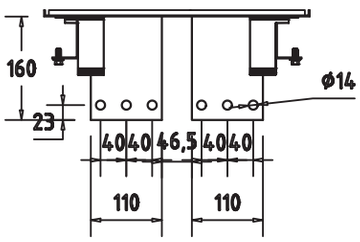

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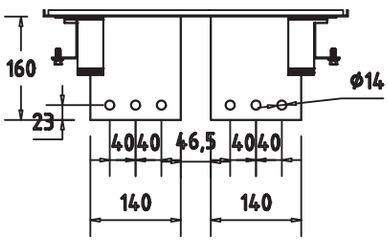

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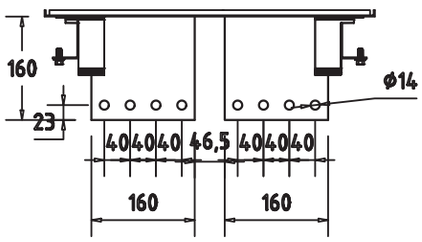

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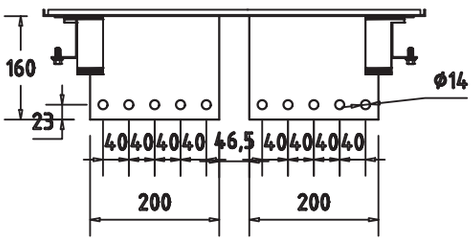

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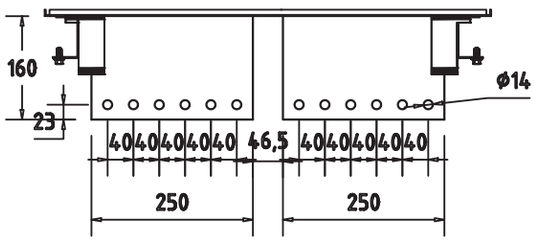

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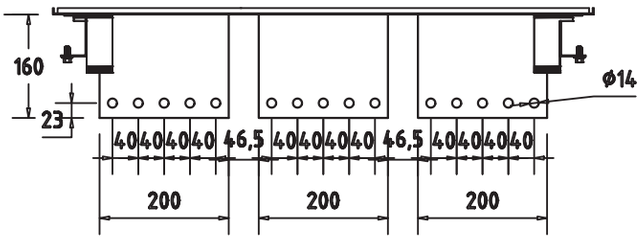
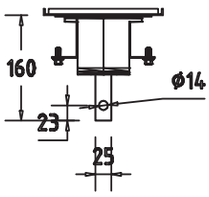


HP-K

Pano Modül Ölçüleri / Bakır

550A



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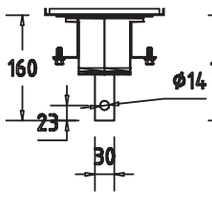

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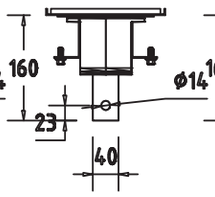

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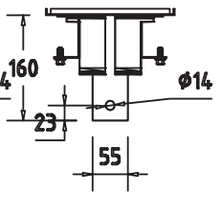

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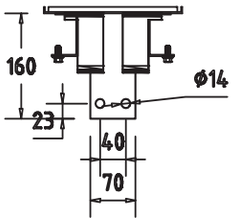

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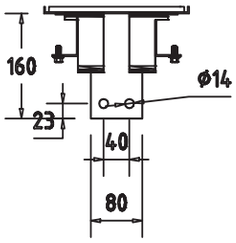

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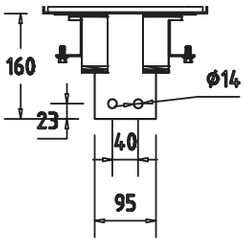

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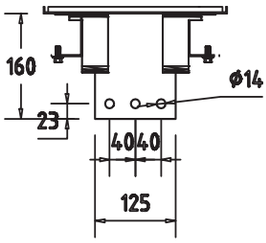

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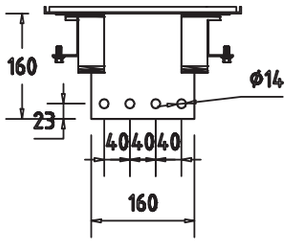

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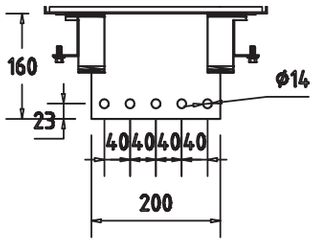

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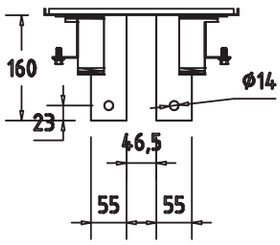

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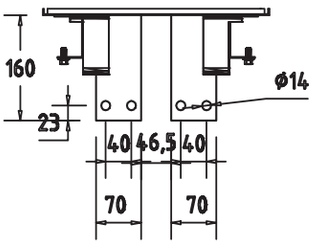

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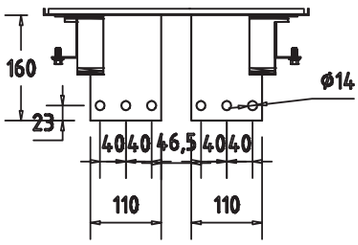

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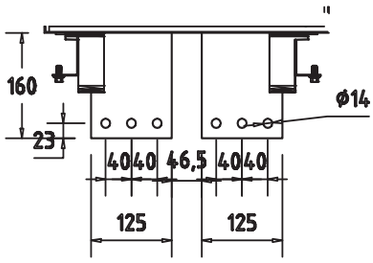

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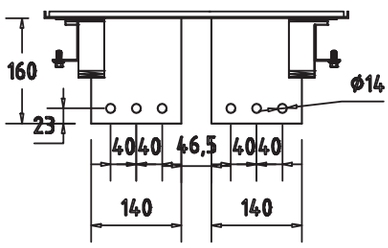

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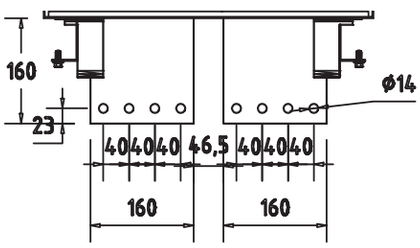

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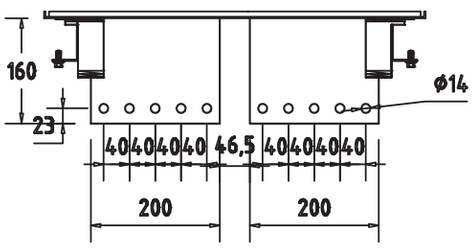

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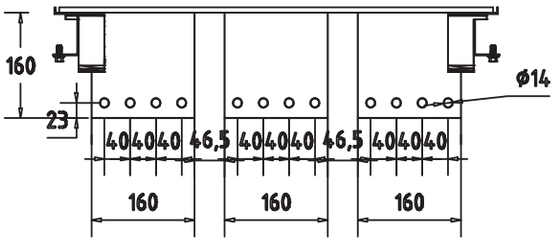

HP-K

Trafo Modül Ölçüleri / Alüminyum

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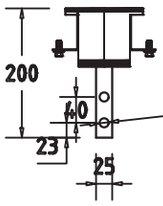

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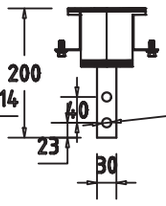

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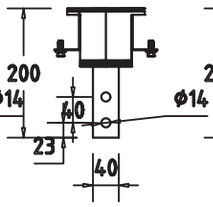

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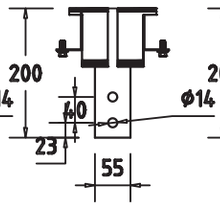

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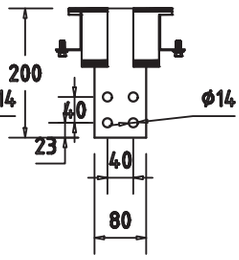

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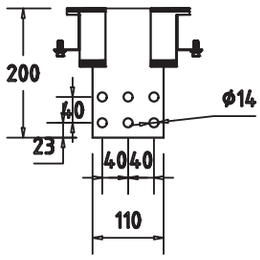

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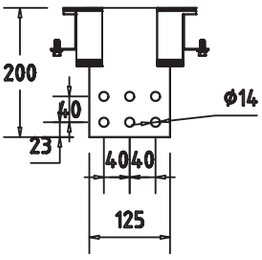

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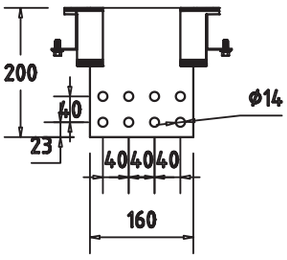

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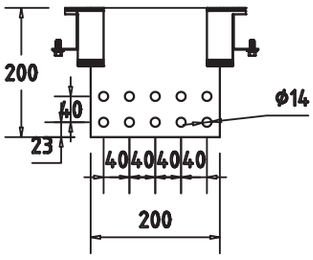

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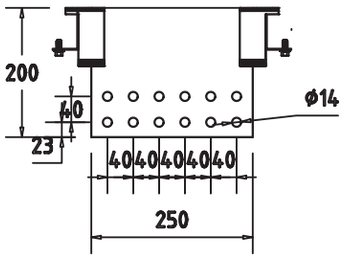

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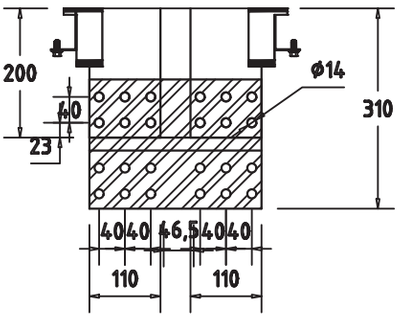

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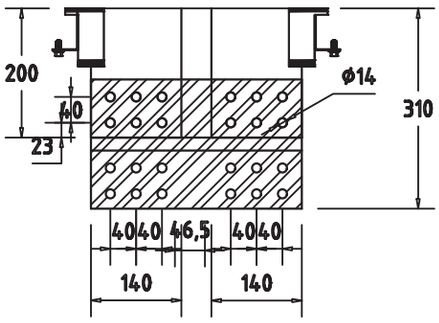

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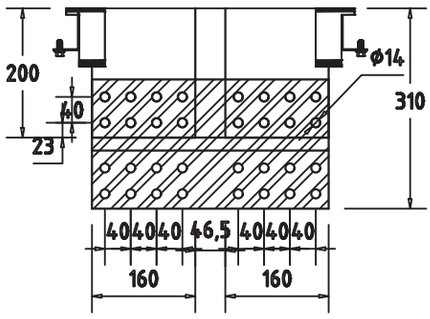

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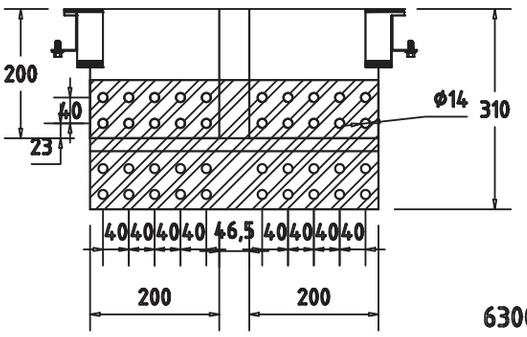

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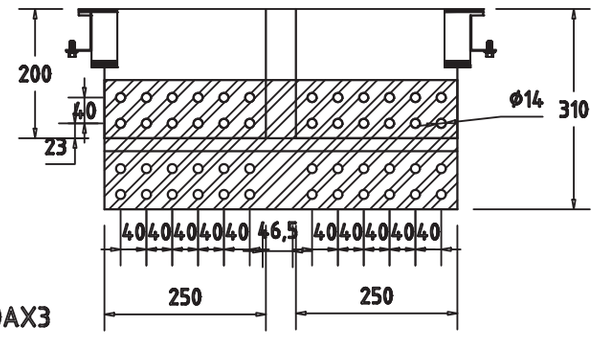

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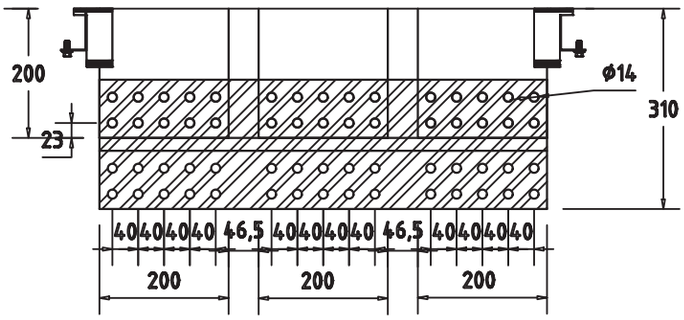
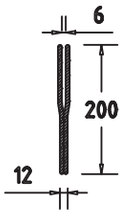
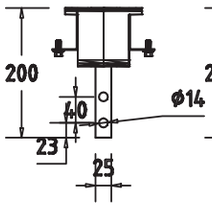




HP-K

Trafo Modül Ölçüleri / Bakır

550A



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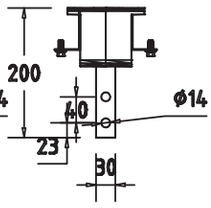

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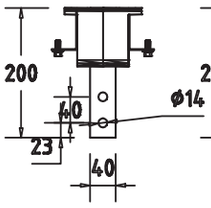

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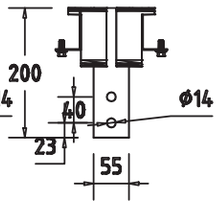

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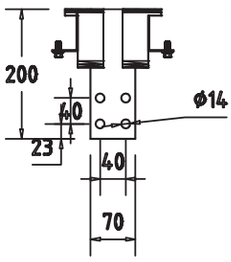

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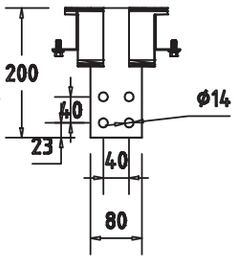

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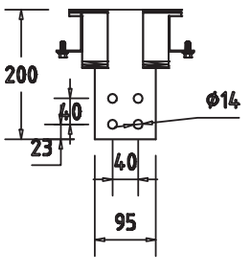

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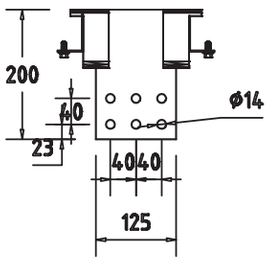

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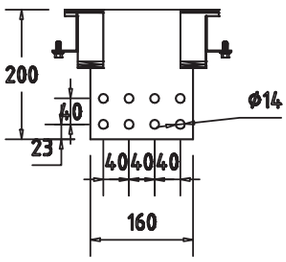

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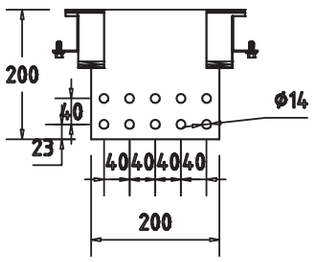

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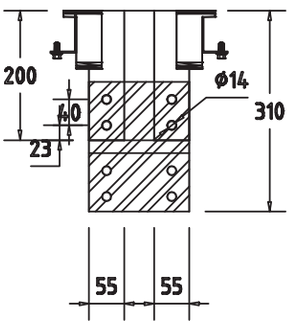

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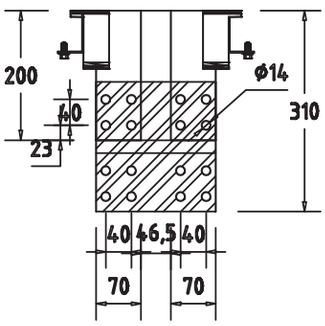

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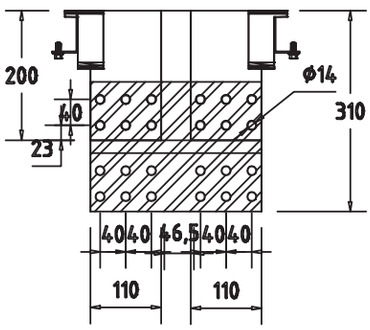

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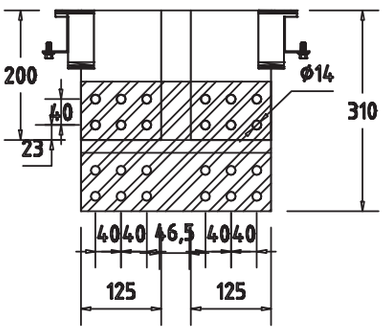

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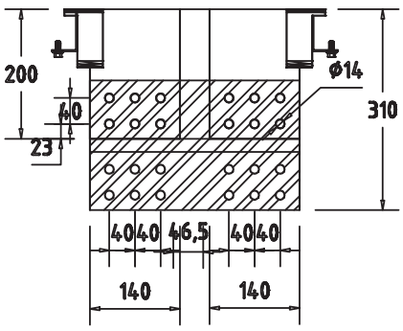

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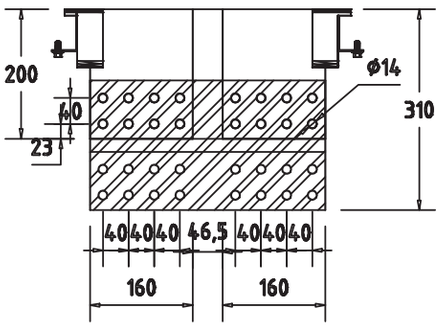

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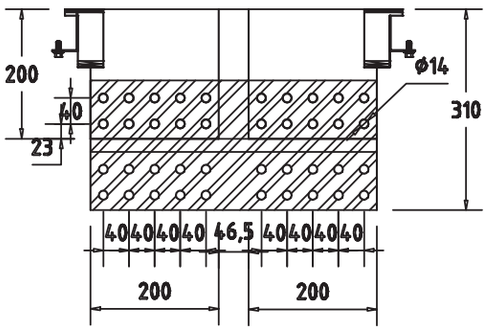

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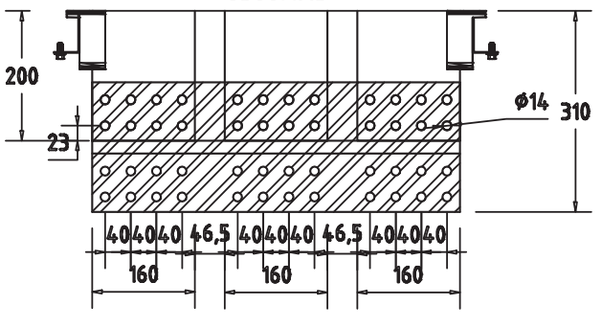
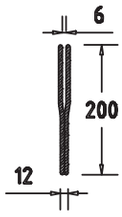




HP-K

Pano Flanj Ölçüleri

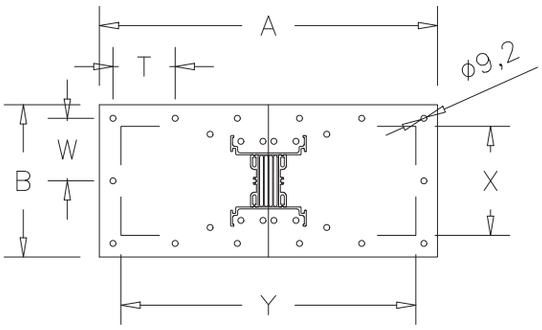


FİG 1

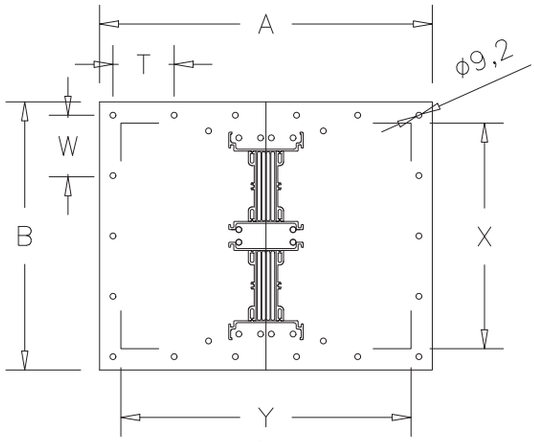


FİG 2

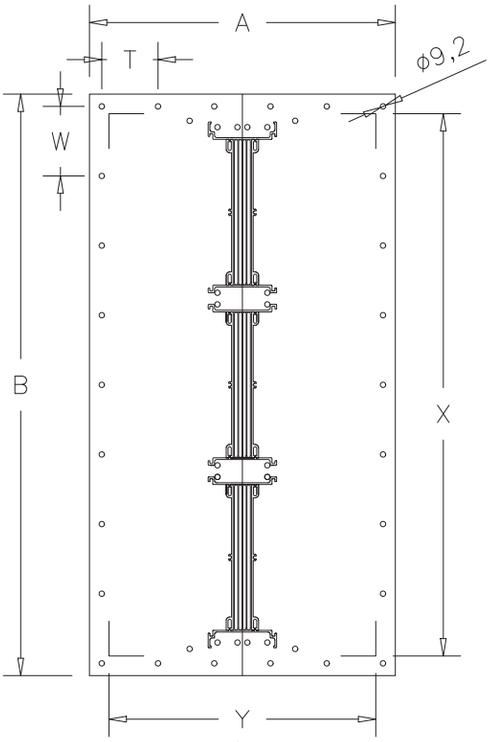
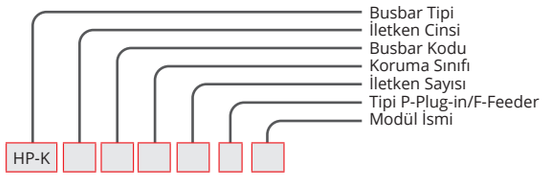


FİG 3

BAĞLANTI ÜNİTESİ ÜST FLANJ ÖLÇÜLERİ (AL)									
AMR.	A (mm)	B (mm)	Y (mm)	X (mm)	T (mm)	R	W (mm)	Ø9 MM R	FİG
400A	520	198	460	130	97	6	77.5	3	1
500A	520	198	460	130	97	6	77.5	3	1
630A	520	198	460	130	97	6	77.5	3	1
800A	520	212	460	145	97	6	85	3	1
1000A	520	237	460	170	97	6	97.5	3	1
1250A	520	267	460	200	97	6	112.5	3	1
1350A	520	282	460	215	97	6	120	3	1
1600A	520	317	460	250	97	6	91.65	4	1
2000A	520	357	460	290	97	6	78.75	5	1
2500A	520	407	460	340	97	6	91.25	5	1
2500A	520	424	460	357	97	6	95.6	5	2
3000A	520	485	460	418	97	6	88.5	6	2
3200A	520	524	460	457	97	6	96.5	6	2
4000A	520	604	460	537	97	6	112.5	6	2
5000A	520	704	460	637	97	6	132.5	6	2
6300A	520	852	460	785	97	6	101.25	9	3
BAĞLANTI ÜNİTESİ ÜST FLANJ ÖLÇÜLERİ (CU)									
AMR.	A (mm)	B (mm)	Y (mm)	X (mm)	T (mm)	R	W (mm)	Ø9 MM R	FİG
550A	520	198	460	130	97	6	77.5	3	1
650A	520	198	460	130	97	6	77.5	3	1
800A	520	198	460	130	97	6	77.5	3	1
1000A	520	217	460	150	97	6	85	3	1
1250A	520	227	460	160	97	6	92.5	3	1
1350A	520	237	460	170	97	6	97.5	3	1
1600A	520	252	460	185	97	6	105	3	1
2000A	520	282	460	215	97	6	120	3	1
2250A	520	317	460	250	97	6	91.6	4	1
2500A	520	357	460	290	97	6	105	4	1
2000A	520	315	460	248	97	6	90.8	4	2
2500A	520	345	460	298	97	6	100.83	4	2
3300A	520	425	460	358	97	6	95.6	5	2
3600A	520	455	460	388	97	6	82.5	6	2
4000A	520	484	460	417	97	6	88.5	6	2
4250A	520	524	460	457	97	6	96.6	6	2
5000A	520	604	460	537	97	6	93.75	7	2
6300A	520	732	460	665	97	6	86.25	9	3

Flexible Bağlantı



Flexible Bağlantı Barası	FB

ÖRNEK SİPARİŞ

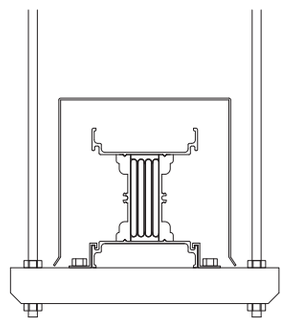
1250 A Alüminyum
Flexible Bara
IP 55 4 İletken

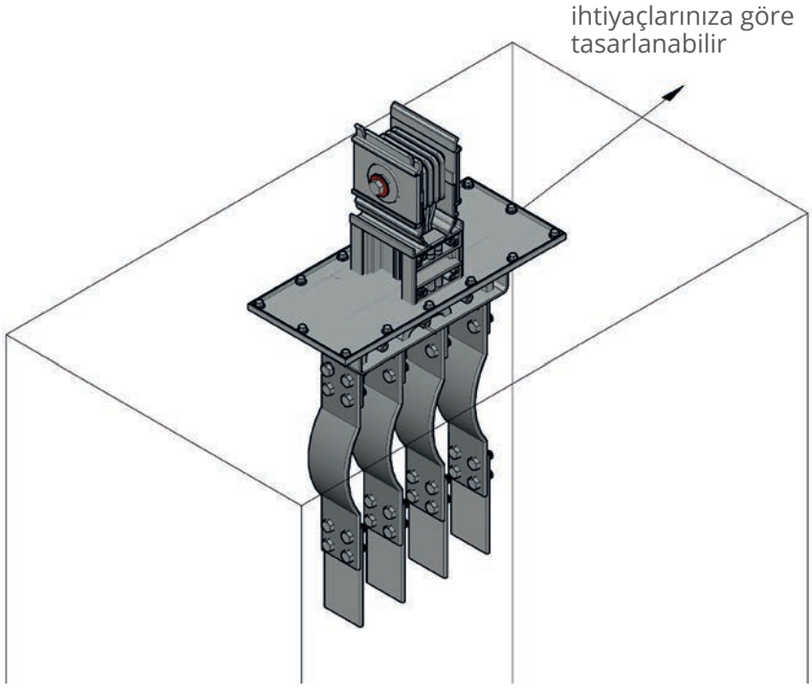
HP-KA125T2FB

FLEXIBLE BARASI CU			
AL		CU	
AMR	W	AMR	W
400A	300-450	550A	300-450
500A	300-450	650A	300-450
630A	300-450	800A	300-450
800A	300-450	1000A	300-450
1000A	300-450	1250A	300-450
1250A	300-450	1350A	300-450
1350A	300-450	1600A	300-450
1600A	300-450	2000A	300-450
2000A	300-450	2250A	300-450
2500A	300-450	2500A	300-450
2500A	300-450	2000A	300-450
3000A	300-450	2500A	300-450
3200A	300-450	3300A	300-450
4000A	300-450	3600A	300-450
5000A	300-450	4000A	300-450
6300A	300-450	4250A	300-450
		5000A	300-450
		6300A	300-450

Flexible

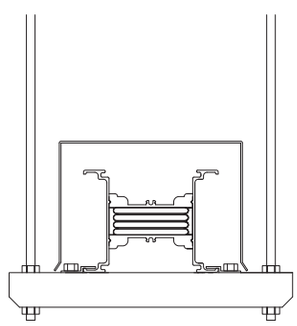
Titreşim iletimi önlemek için, transformatörü baranın bağlantı arabirimine mekanik olarak ayırmanın gerektiği durumlarda esnek örgü bağlantıları kullanılır.





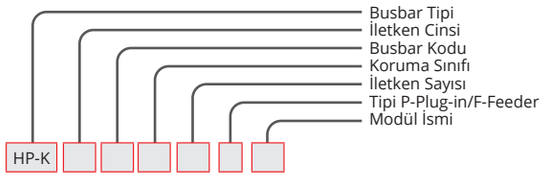
Kanopi

IP55 koruma derecesinin yeterli olmadığı açık alanlarda kanopi sistemi kullanmak gerekir. Kanopi sisteminin uygulanması busbarın koruma derecesini değiştirmez.



HP-K

Pano Körüklü Flans

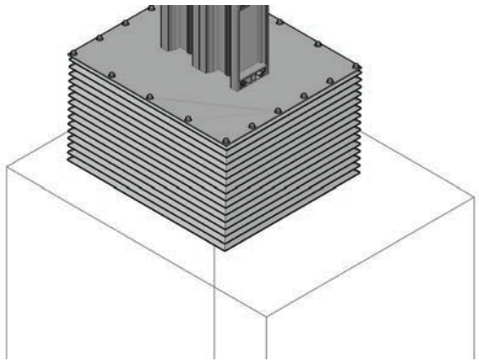


Pano Körük Flans	PKF

ÖRNEK SİPARİŞ

2500 A Alüminyum
Pano Körük
IP 55 4 İletken

HP-HA255T2R1PKF



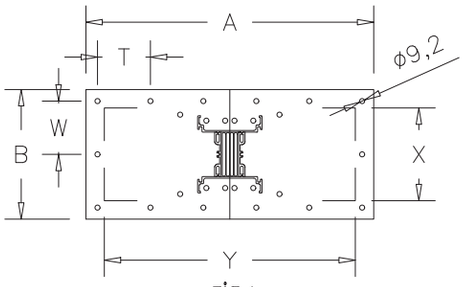


FİG 1

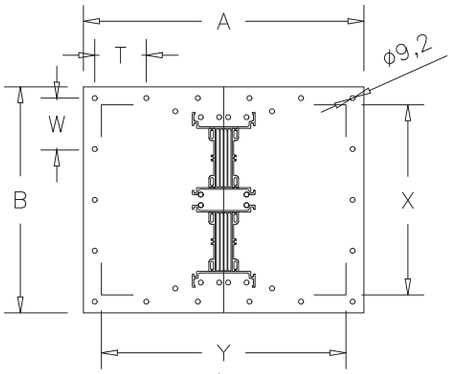


FİG 2

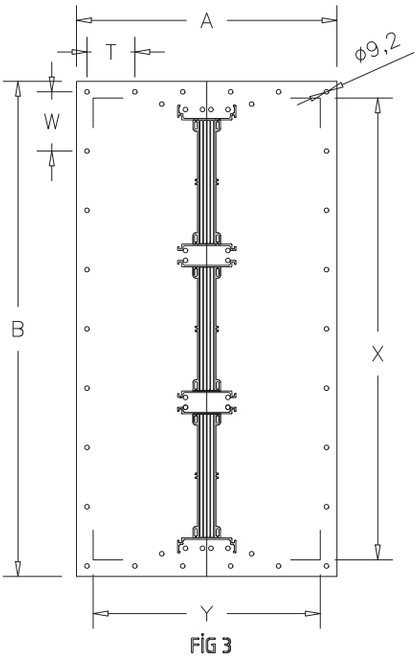
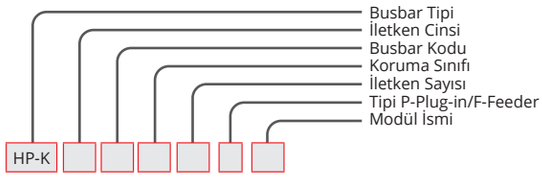
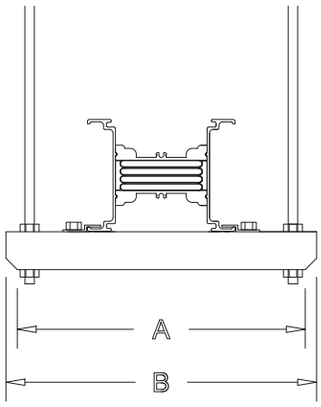


FİG 3

BAĞLANTI ÜNİTESİ ÜST FLANJ ÖLÇÜLERİ (AL)									
AMR.	A (mm)	B (mm)	Y (mm)	X (mm)	T (mm)	R	W (mm)	Ø9 MM R	FİG
400A	520	198	460	130	97	6	77.5	3	1
500A	520	198	460	130	97	6	77.5	3	1
630A	520	198	460	130	97	6	77.5	3	1
800A	520	212	460	145	97	6	85	3	1
1000A	520	237	460	170	97	6	97.5	3	1
1250A	520	267	460	200	97	6	112.5	3	1
1350A	520	282	460	215	97	6	120	3	1
1600A	520	317	460	250	97	6	91.65	4	1
2000A	520	357	460	290	97	6	78.75	5	1
2500A	520	407	460	340	97	6	91.25	5	1
2500A	520	424	460	357	97	6	95.6	5	2
3000A	520	485	460	418	97	6	88.5	6	2
3200A	520	524	460	457	97	6	96.5	6	2
4000A	520	604	460	537	97	6	112.5	6	2
5000A	520	704	460	637	97	6	132.5	6	2
6300A	520	852	460	785	97	6	101.25	9	3
BAĞLANTI ÜNİTESİ ÜST FLANJ ÖLÇÜLERİ (CU)									
AMR.	A (mm)	B (mm)	Y (mm)	X (mm)	T (mm)	R	W (mm)	Ø9 MM R	FİG
550A	520	198	460	130	97	6	77.5	3	1
650A	520	198	460	130	97	6	77.5	3	1
800A	520	198	460	130	97	6	77.5	3	1
1000A	520	217	460	150	97	6	85	3	1
1250A	520	227	460	160	97	6	92.5	3	1
1350A	520	237	460	170	97	6	97.5	3	1
1600A	520	252	460	185	97	6	105	3	1
2000A	520	282	460	215	97	6	120	3	1
2250A	520	317	460	250	97	6	91.6	4	1
2500A	520	357	460	290	97	6	105	4	1
2000A	520	315	460	248	97	6	90.8	4	2
2500A	520	345	460	298	97	6	100.83	4	2
3300A	520	425	460	358	97	6	95.6	5	2
3600A	520	455	460	388	97	6	82.5	6	2
4000A	520	484	460	417	97	6	88.5	6	2
4250A	520	524	460	457	97	6	96.6	6	2
5000A	520	604	460	537	97	6	93.75	7	2
6300A	520	732	460	665	97	6	86.25	9	3

Yatay Askı Takımı (U)



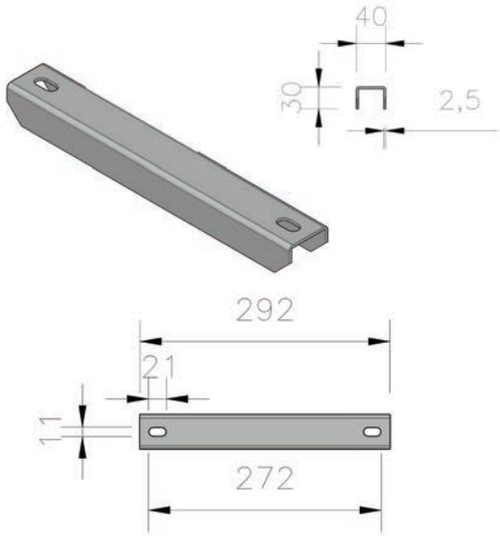


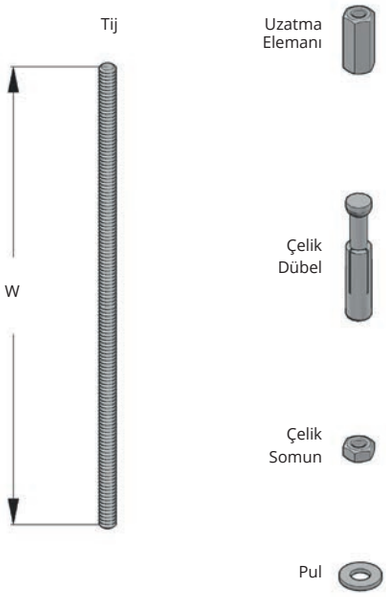
Özel Yatay Askı Takımı Yatay Uygulama	YUP

ÖRNEK SİPARİŞ

5000 A Alüminyum
Yatay Askı
IP 55 4 İletken

HP-KA505T2YUP





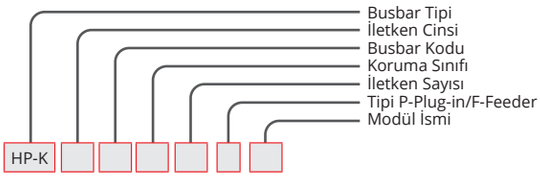
BAĞLANTI ELEMANLARI		
Açıklama	W(mm)	Kodu
B-E 12 Tij Askı (M10)	500	BE101
B-E 12 Tij Askı (M10)	1000	BE102
B-E 14 Tij Askı (M12)	500	BE103
B-E 14 Tij Askı (M12)	1000	BE104
(M10) Uzatma Elemanı	-	BE105
(M12) Uzatma Elemanı	-	BE106
M 10 Çekmeli Dübel	-	BE107
M 12 Çekmeli Dübel	-	BE108
M 10 Çelik Somun	-	BE109
M 12 Çelik Somun	-	BE110
M 10 Pul	-	BE111
M 12 Pul	-	BE112

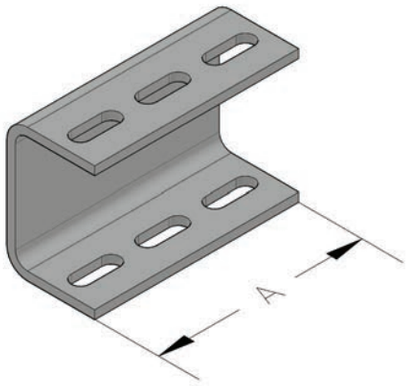
ÖZEL YATAY ASKI TAKIMI YATAY UYGULAMA					
(AL)			(CU)		
AMR	A	B	AMR	A	B
400A	252	292	550A	252	292
500A	252	292	650A	252	292
630A	252	292	800A	252	292
800A	268	308	1000A	268	308
1000A	292	332	1250A	282	322
1250A	322	362	1350A	292	332
1350A	337	377	1600A	322	362
1600A	372	412	2000A	352	392
2000A	412	452	2250A	372	412
2500A	462	502	2500A	412	452
2500A	497	519	2000A	369	409
3000A	539	579	2500A	419	459
3200A	579	619	3300A	479	519
4000A	659	699	3600A	509	549
5000A	759	799	4000A	539	579
6300A	1056	1096	4250A	579	619
			5000A	659	699
			6300A	905	945

Matkap Ucu Çapı:

M10.....Ø14
M12.....Ø16

Özel Yatay Askı (U)





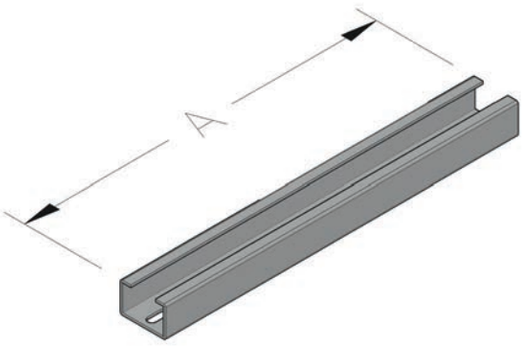
Yatay Tavan Kiti	YTK

ÖRNEK SİPARİŞ

1000 A Alüminyum
Yatay Tavan Kiti
IP 55 4 İletken

HP-KA105T2YTK

YATAY TAVAN BAĞLANTI KİTİ (U PROFİL)			
AL		CU	
AMR	A	AMR	A
400A	100	550A	100
500A	100	650A	100
630A	100	800A	100
800A	100	1000A	100
1000A	100	1250A	100
1250A	100	1350A	100
1350A	100	1600A	100
1600A	100	2000A	100
2000A	100	2250A	100
2500A	100	2500A	100
2500A	100	2000A	100
3000A	100	2500A	100
3200A	100	3300A	100
4000A	100	3600A	100
5000A	100	4000A	100
6300A	100	4250A	100
		5000A	100
		6300A	100



Yatay Askı Takımı Özel	YVA

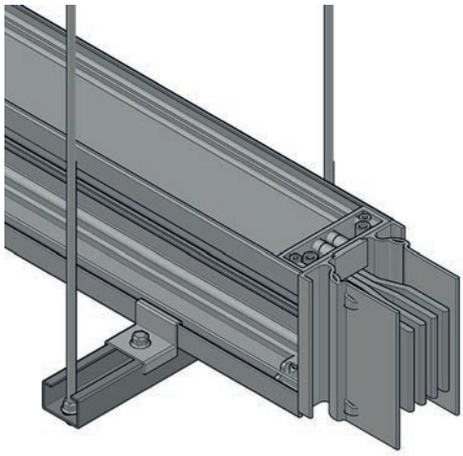
ÖRNEK SİPARİŞ

1000 A Alüminyum
Yatay Askı
IP 55 4 İletken

HP-KA105T2YVA

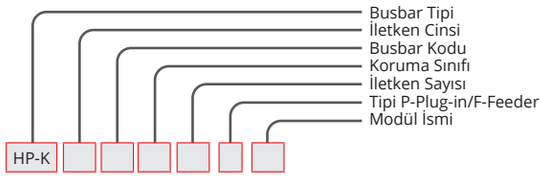
HP-K

YATAY ASKI TAKIMI YATAY ÖZEL (U PROFİL)			
AL		CU	
AMR	A	AMR	A
400A	252	550A	252
500A	252	650A	252
630A	252	800A	252
800A	267	1000A	267
1000A	292	1250A	282
1250A	322	1350A	292
1350A	337	1600A	307
1600A	372	2000A	337
2000A	412	2250A	372
2500A	462	2500A	412
2500A	479	2000A	369
3000A	539	2500A	419
3200A	579	3300A	479
4000A	659	3600A	509
5000A	759	4000A	539
6300A	907	4250A	579
		5000A	659
		6300A	907



YATAY ASKI TAKIMI DİKEY ÖZEL (U PROFİL)			
AL		CU	
AMR	A	AMR	A
400A	355	550A	355
500A	355	650A	355
630A	355	800A	355
800A	355	1000A	355
1000A	355	1250A	355
1250A	355	1350A	355
1350A	355	1600A	355
1600A	355	2000A	355
2000A	355	2250A	355
2500A	355	2500A	355
2500A	355	2000A	355
3000A	355	2500A	355
3200A	355	3300A	355
4000A	355	3600A	355
5000A	355	4000A	355
6300A	355	4250A	355
		5000A	355
		6300A	355

Sabit Şaft Askı Takımı

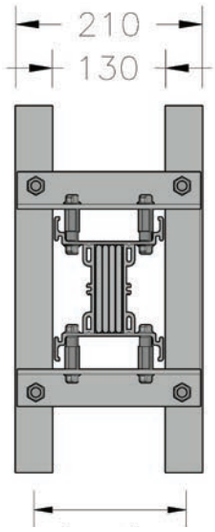


Şaft Askı Takımı	HPS

ÖRNEK SİPARİŞ

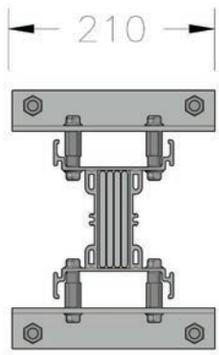
1250 A Alüminyum
Şaft Askısı
IP 55 4 İletken

HP-KA125T2HPS

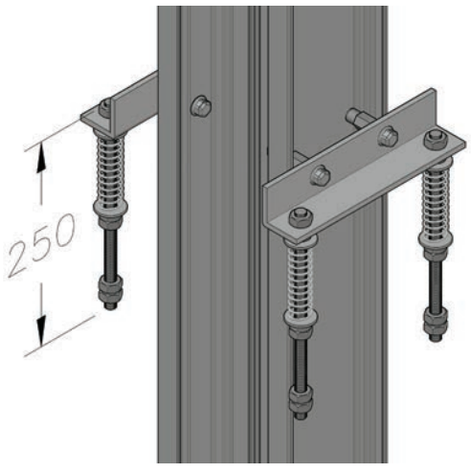


MÜŞTERİ TEMİN EDECEK
60x40 U PROFİL

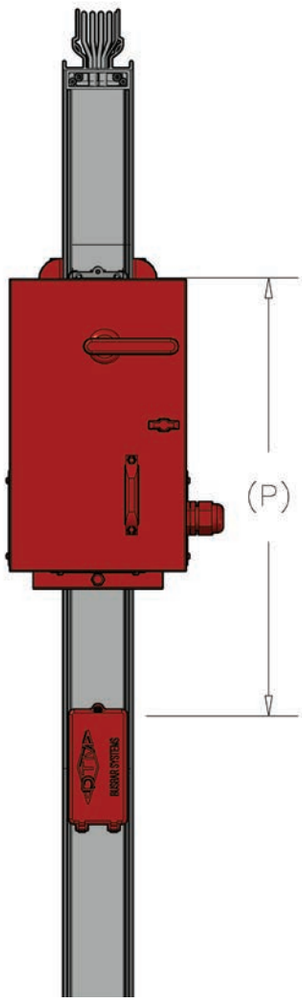
ÜST GÖRÜNÜŞ



YAN GÖRÜNÜŞ



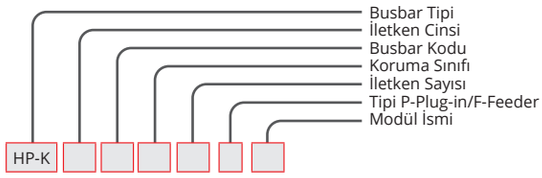
ŞAFT ASKI TAKIMI	
AMR	AMR
HPS04	HPS05
HPS05	HPS06
HPS06	HPS07
HPS08	HPS09
HPS10	HPS13
HPS12	HPS15
HPS14	HPS17
HPS16	HPS21
HPS20	HPS23
HPS25	HPS24
HPS26	HPS22
HPS30	HPS27
HPS32	HPS33
HPS40	HPS36
HPS50	HPS41
HPS63	HPS42
	HPS51
	HPS63



ÇIKIŞ ÜNİTESİ	MİNİMUM DELİK HATVESİ
AMR	P (mm)
50A-200A	650
400A	900
600A	1000
800A	1000
1000A	1300
1200A	1300

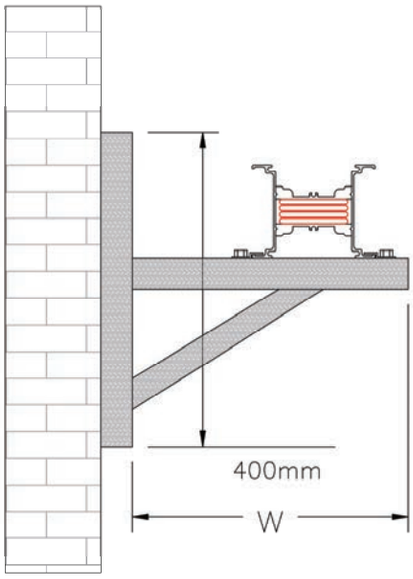
HP-K

Duvar Askı Takımı



Duvar Askı Takımı Yatay Uygulama	DYA

Duvar Askı Standart (YATAY)



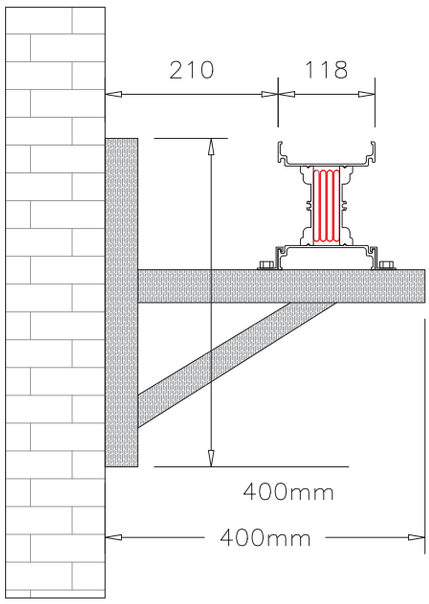
ÖRNEK SİPARİŞ

1600 A Alüminyum
Duvar Askısı
IP 55 4 İletken

HP-KA165T2DYA

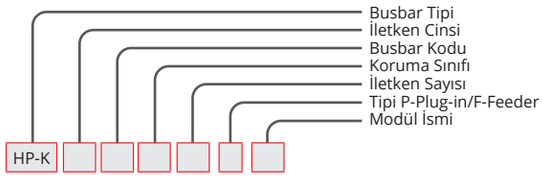
DUVAR ASKI TAKIMI (YATAY)			
AL		CU	
AMR	W	AMR	W
400A	372	550A	372
500A	372	650A	372
630A	372	800A	372
800A	387	1000A	387
1000A	412	1250A	402
1250A	442	1350A	412
1350A	457	1600A	427
1600A	492	2000A	457
2000A	532	2250A	492
2500A	582	2500A	532
2500A	599	2000A	489
3000A	659	2500A	539
3200A	699	3300A	599
4000A	779	3600A	629
5000A	879	4000A	659
6300A	1027	4250A	699
		5000A	779
		6300A	879

Duvar Askı Standart (DİKEY)



HP-K

Yaylı Şaft Askı Takımı



Yaylı Şaft Askı Takımı	SA

ÖRNEK SİPARİŞ

1000 A Alüminyum
Yaylı Askı
IP 55 4 İletken

HP-KA105T2SA

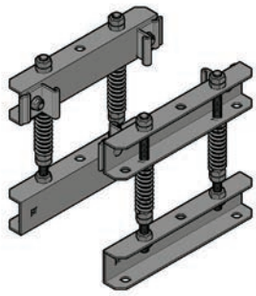


FİG 2

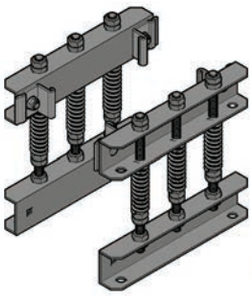


FİG 3

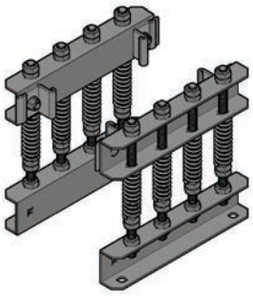
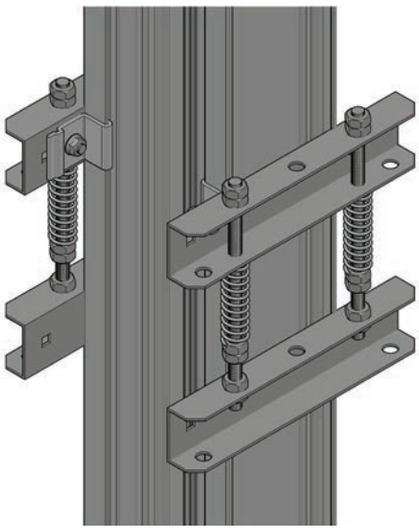
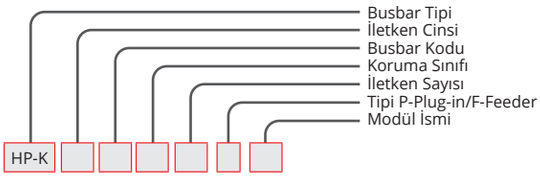


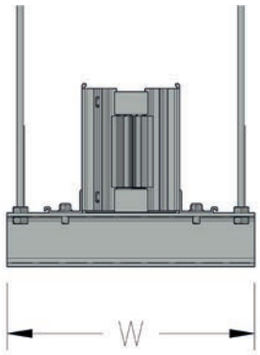
FİG 4

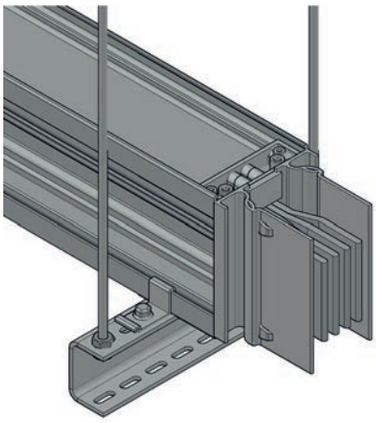
YAYLI ŞAFT ASKI BAĞLANTI FİGÜRLERİ			
AL		CU	
400A	FİG2	550A	FİG2
500A	FİG2	650A	FİG2
630A	FİG2	800A	FİG2
800A	FİG2	1000A	FİG2
1000A	FİG2	1250A	FİG3
1250A	FİG2	1350A	FİG3
1350A	FİG2	1600A	FİG3
1600A	FİG2	2000A	FİG3
2000A	FİG3	2250A	FİG3
2500A	FİG3	2500A	FİG3
2500A	FİG3	2000A	FİG4
3000A	FİG4	2500A	FİG4
3200A	FİG4	3300A	FİG4
4000A	FİG4	3600A	FİG4
5000A	FİG4	4000A	FİG4
6300A	FİG4	4250A	FİG4
		5000A	FİG4
		6300A	FİG4



Yatay Askı Takımı







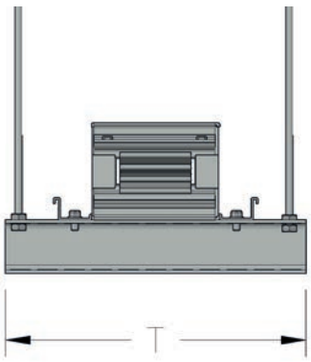
Yatay Askı Takımı Dikey Uygulama	YUD

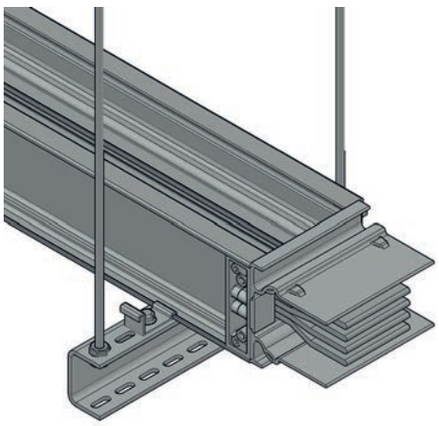
ÖRNEK SİPARİŞ

800 A Alüminyum
Yatay Askı
IP 55 4 İletken

HP-KA085T2YUD

YATAY ASKI TAKIMI DİKEY UYGULAMA			
AL		CU	
AMR	W	AMR	W
400A	300	550A	300
500A	300	650A	300
630A	300	800A	300
800A	300	1000A	300
1000A	300	1250A	300
1250A	300	1350A	300
1350A	300	1600A	300
1600A	300	2000A	300
2000A	300	2250A	300
2500A	300	2500A	300
2500A	300	2000A	300
3000A	300	2500A	300
3200A	300	3300A	300
4000A	300	3600A	300
5000A	300	4000A	300
6300A	300	4250A	300
		5000A	300
		6300A	300





Yatay Askı Takımı Yatay Uygulama	YUY

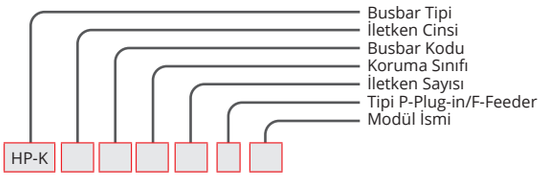
ÖRNEK SİPARİŞ

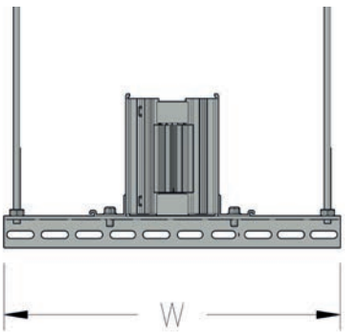
1000 A Alüminyum
Yatay Askı
IP 55 4 İletken

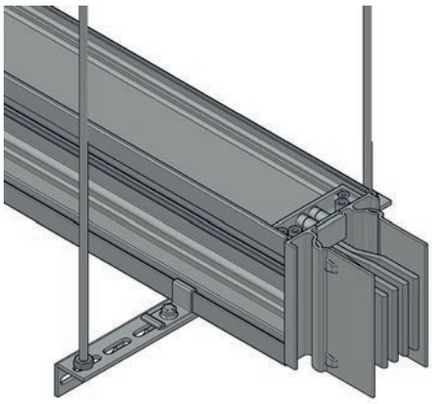
HP-KA105T2YUY

YATAY ASKI TAKIMI YATAY UYGULAMA			
AL		CU	
AMR	T	AMR	T
400A	252	550A	252
500A	252	650A	252
630A	252	800A	252
800A	267	1000A	267
1000A	292	1250A	282
1250A	322	1350A	292
1350A	337	1600A	307
1600A	372	2000A	337
2000A	412	2250A	372
2500A	462	2500A	412
2500A	479	2000A	369
3000A	539	2500A	419
3200A	579	3300A	479
4000A	659	3600A	509
5000A	759	4000A	539
6300A	907	4250A	579
		5000A	659
		6300A	907

Yatay Askı Takımı (L)







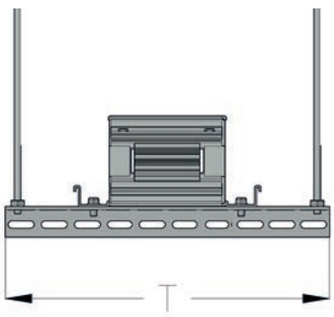
Yatay Askı Takımı Dikey Uygulama	YLD

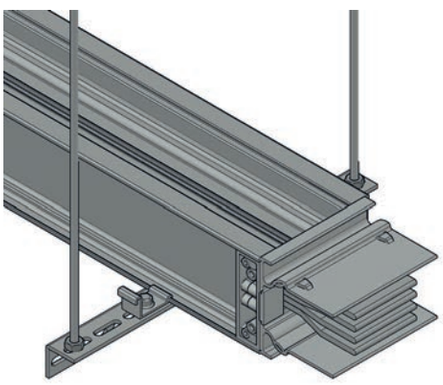
ÖRNEK SİPARİŞ

1350 A Alüminyum
Yatay Köşebent Askı
IP 55 4 İletken

HP-KA135T2YLD

YATAY ASKI TAKIMI DİKEY UYGULAMA (L KÖŞEBENT) 50X50			
AL		CU	
AMR	W	AMR	W
400A	300	550A	300
500A	300	650A	300
630A	300	800A	300
800A	300	1000A	300
1000A	300	1250A	300
1250A	300	1350A	300
1350A	300	1600A	300
1600A	300	2000A	300
2000A	300	2250A	300
2500A	300	2500A	300
2500A	300	2000A	300
3000A	300	2500A	300
3200A	300	3300A	300
4000A	300	3600A	300
5000A	300	4000A	300
6300A	300	4250A	300
		5000A	300
		6300A	300





Yatay Askı Takımı Yatay Uygulama	YLY

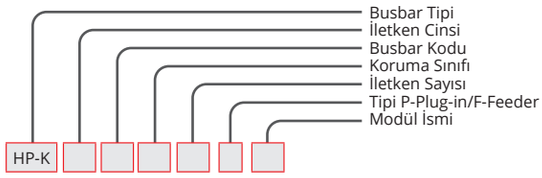
ÖRNEK SİPARİŞ

1600 A Alüminyum
Yatay Köşebent Askı
IP 55 4 İletken

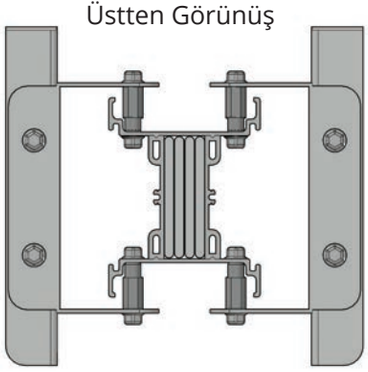
HP-HA165T2YLY

YATAY ASKI TAKIMI YATAY UYGULAMA (L KÖŞEBENT) 50X50			
AL		CU	
AMR	T	AMR	T
400A	252	550A	252
500A	252	650A	252
630A	252	800A	252
800A	267	1000A	267
1000A	292	1250A	282
1250A	322	1350A	292
1350A	337	1600A	307
1600A	372	2000A	337
2000A	412	2250A	372
2500A	462	2500A	412
2500A	479	2000A	369
3000A	539	2500A	419
3200A	579	3300A	479
4000A	659	3600A	509
5000A	759	4000A	539
6300A	907	4250A	579
		5000A	659
		6300A	907

Şaft Duvar Askı Takımı



Üstten Görünüş

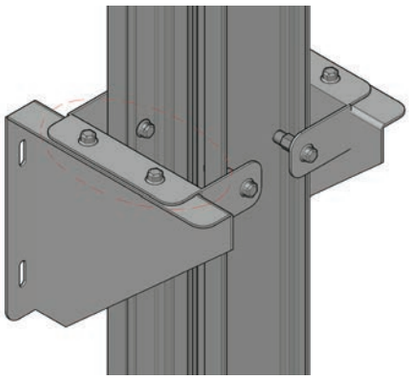


Şaft Duvar Askısı Takımı	SD

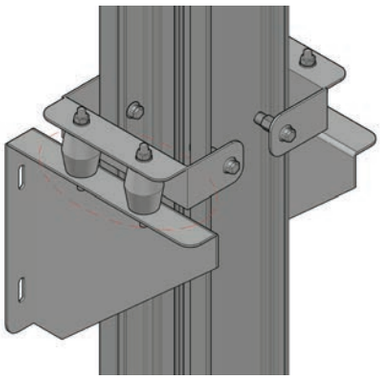
ÖRNEK SİPARİŞ

800 A Alüminyum
Yatay Askı
IP 55 4 İletken

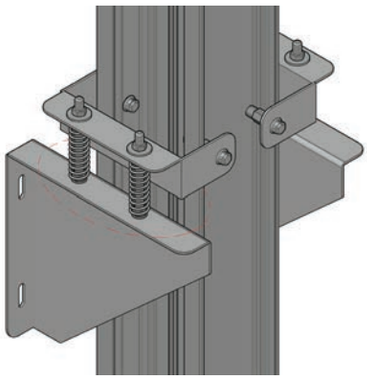
HP-KA085T2SD3



(1)
Sabit



(2)
Kauçuklu



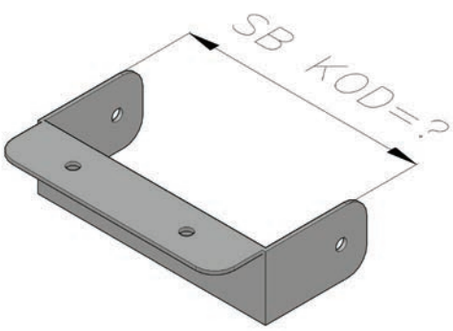
(3)
Yaylı

Şaft Busbar Bağlantı Elemanı	SB

ÖRNEK SİPARİŞ

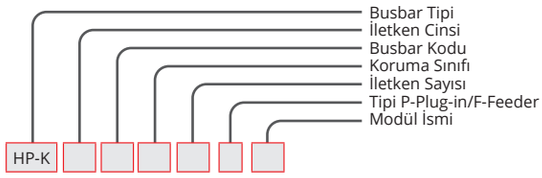
1000 A Alüminyum
Şaft Bağlantı Elemanı
IP 55 4 İletken

HP-KA105T2SBA5



ŞAFT BAĞLANTI ELEMANI (ÖZEL)			
AL		CU	
AMR	KOD	AMR	KOD
400A	SBA1	550A	SBC1
500A	SBA2	650A	SBC2
630A	SBA3	800A	SBC3
800A	SBA4	1000A	SBC4
1000A	SBA5	1250A	SBC5
1250A	SBA6	1350A	SBC6
1350A	SBA7	1600A	SBC7
1600A	SBA8	2000A	SBC8
2000A	SBA9	2250A	SBC9
2500A	SBA10	2500A	SBC10
2500A	SBA11	2000A	SBC11
3000A	SBA12	2500A	SBC12
3200A	SBA13	3300A	SBC13
4000A	SBA14	3600A	SBC14
5000A	SBA15	4000A	SBC15
6300A	SBA16	4250A	SBC16
		5000A	SBC17
		6300A	SBC18

Şaft Duvar Askı Takımı

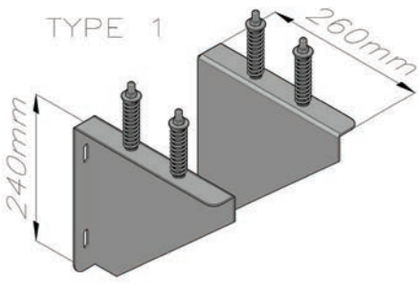


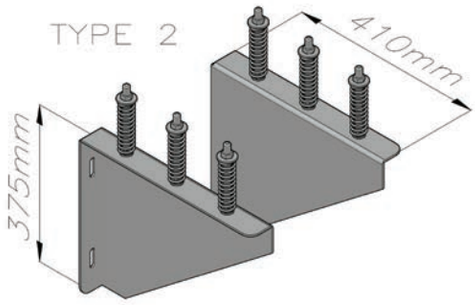
Şaft Duvar Askı Takımı	TYPE

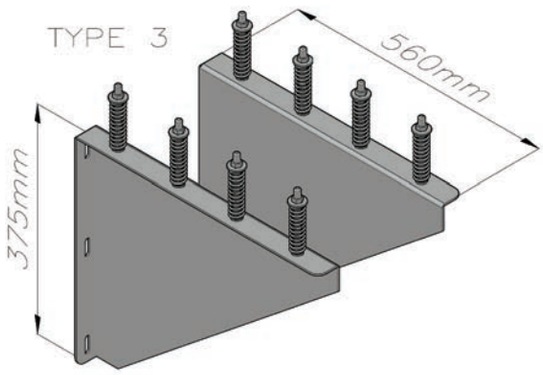
ÖRNEK SİPARİŞ

1000 A Alüminyum
Şaft Duvar Askı Takımı
IP 55 4 İletken

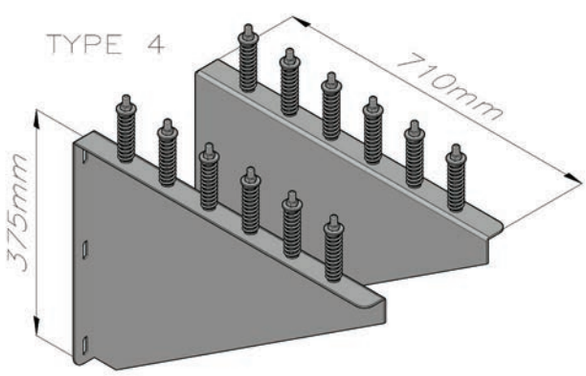
HP-KA105T2TYPE1

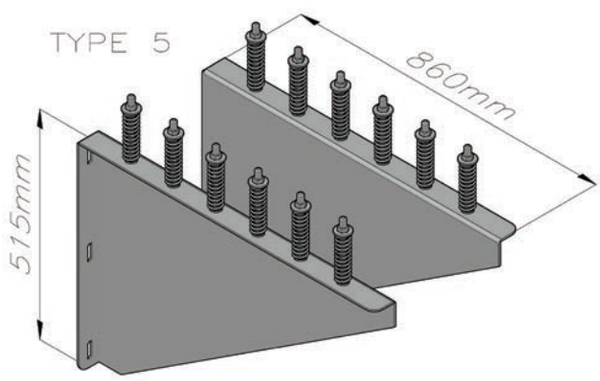






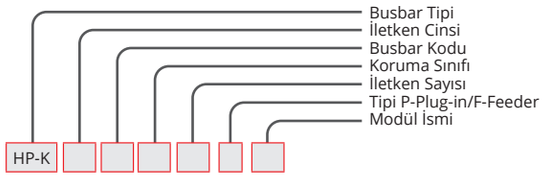
ŞAFT DUVAR ASKI TAKIMI TABLOSU			
AL		CU	
AMR	TPYE	AMR	TPYE
400A	TYPE1	550A	TYPE1
500A	TYPE1	650A	TYPE1
630A	TYPE1	800A	TYPE1
800A	TYPE1	1000A	TYPE1
1000A	TYPE1	1250A	TYPE1
1250A	TYPE2	1350A	TYPE2
1350A	TYPE2	1600A	TYPE2
1600A	TYPE2	2000A	TYPE2
2000A	TYPE2	2250A	TYPE2
2500A	TYPE2	2500A	TYPE2
2500A	TYPE4	2000A	TYPE2
3000A	TYPE3	2500A	TYPE3
3200A	TYPE3	3300A	TYPE3
4000A	TYPE4	3600A	TYPE3
5000A	TYPE5	4000A	TYPE4
6300A	TYPE5	4250A	TYPE4
		5000A	TYPE5
		6300A	TYPE5

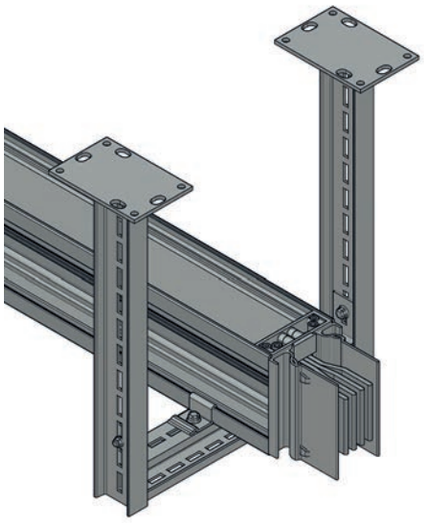


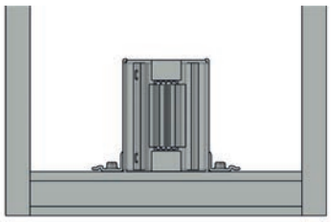


HP-K

Yatay NPI Askı Takımı





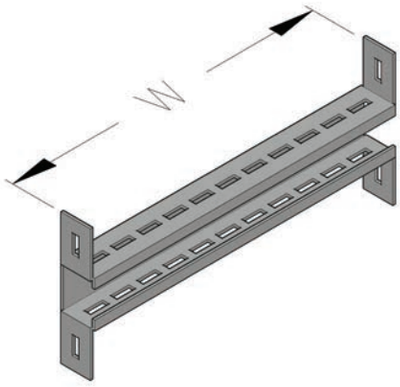


Yatay Askı Takımı Dikey Uygulama	YID

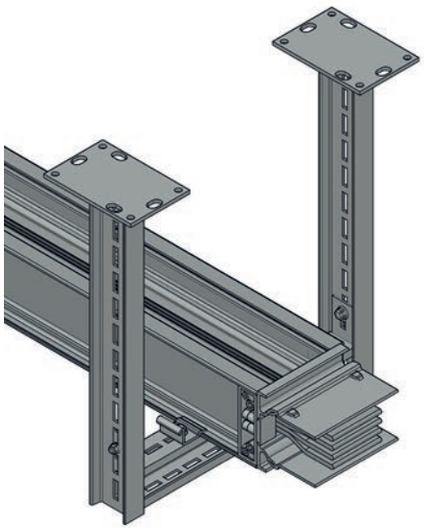
ÖRNEK SİPARİŞ

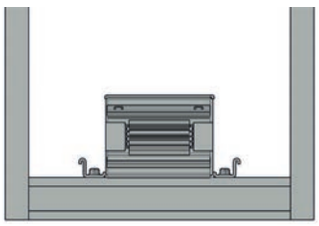
800 A Alüminyum
Yatay Askı
IP 55 4 İletken

HP-KA085T2YID



YATAY ASKI TAKIMI DİKEY UYGULAMA			
AL		CU	
AMR	W	AMR	W
400A	300	550A	300
500A	300	650A	300
630A	300	800A	300
800A	300	1000A	300
1000A	300	1250A	300
1250A	300	1350A	300
1350A	300	1600A	300
1600A	300	2000A	300
2000A	300	2250A	300
2500A	300	2500A	300
2500A	300	2000A	300
3000A	300	2500A	300
3200A	300	3300A	300
4000A	300	3600A	300
5000A	300	4000A	300
6300A	300	4250A	300
		5000A	300
		6300A	300



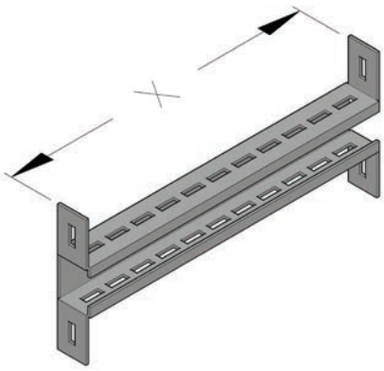


Yatay Askı Takımı Yatay Uygulama	YIY

ÖRNEK SİPARİŞ

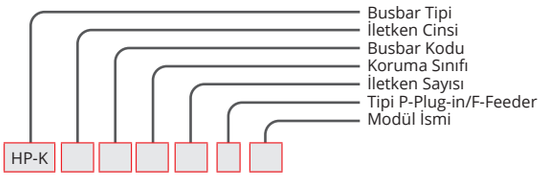
1000 A Alüminyum
Yatay Askı
IP 55 4 İletken

HP-KA105T2YIY

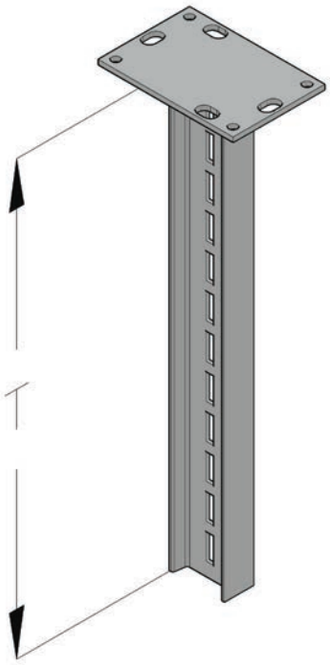


YATAY ASKI TAKIMI YATAY UYGULAMA			
AL		CU	
AMR	W	AMR	W
400A	252	550A	252
500A	252	650A	252
630A	252	800A	252
800A	267	1000A	267
1000A	292	1250A	282
1250A	322	1350A	292
1350A	337	1600A	307
1600A	372	2000A	337
2000A	412	2250A	372
2500A	462	2500A	412
2500A	479	2000A	369
3000A	539	2500A	419
3200A	579	3300A	479
4000A	659	3600A	509
5000A	759	4000A	539
6300A	907	4250A	579
		5000A	659
		6300A	907

Tavan NPI Askı



Tavan Askı NPI	IYD

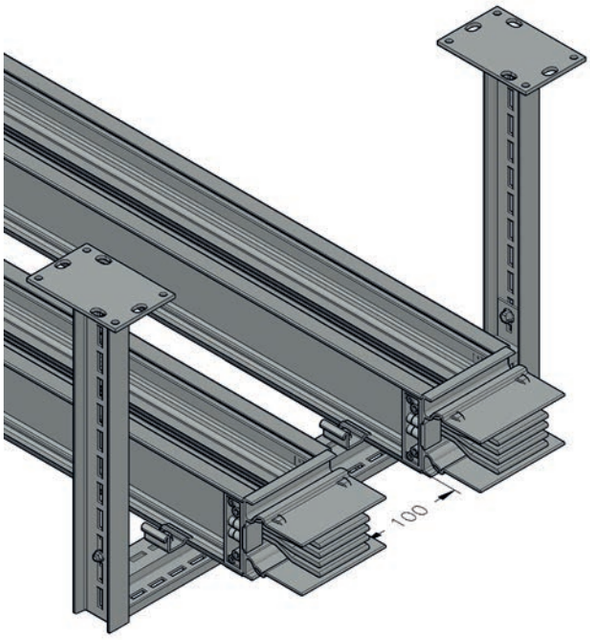


ÖRNEK SİPARİŞ

1600 A Alüminyum
Tavan NPI Askı
IP 55 4 İletken

HP-KA165T2IYD

NPI TAVAN BAĞLANTI ELEMANI		
Açıklama	T (mm)	Kodu
NPI ASKI (5)	500	NPI5
NPI ASKI (10)	1000	NPI10
NPI ASKI (15)	1500	NPI15
NPI ASKI (20)	2000	NPI20



HP-K

TEKNİK TABLO & TECHNICAL TABLE (HP-K AL)

ALÜMİNYUM İLETKEN (AL)

Beyan Akımı	In	A	400	500	630	800	1000
Busbar Kodu			HP-KA04	HP-KA05	HP-KA06	HP-KA08	HP-KA10
Koruma Sınıfı	IP55						
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1						
Maks.Beyan Çalışma Gerilimi	Ue	Vac	1000				
Beyan Darbe Dayanım Gerilimi	Uimp	kV	8				
Beyan Frekansı	f	Hz	50				
Beyan Yalıtım Gelirimi	Ui	V	1000	Katagori IV			
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK10						
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS HD 60364-4-41, madde A1)						
Beyan Kısa Süreli Akım (1s)	Icw	kA	15	18	25	35	60
Beyan Tepe Dayanma Akımı	Ipk	kA	32	36	52,6	73,6	105,5
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	9,8	9,8	14	20	30,2
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	17	17	30,5	44	64
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	9,8	9,8	14	20	30,2
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	17	17	30,5	44	64
20 °C İletken Sıcaklığında Direnç	R_{20}	mΩ/m	0.280	0.236	0.155	0.110	0.080
35 °C Ortam Hava Sıcaklığında Direnç	R	mΩ/m	0.310	0.264	0.174	0.140	0.090
Sıcaklıktan Bağımsız Reaktans	X	mΩ/m	0.032	0.022	0.026	0.025	0.016
20 °C İletken Sıcaklığında Empedans	Z_{20}	mΩ/m	1.023	0.854	0.616	0.478	0.366
35 °C Ortam Hava Sıcaklığında Empedans	Z_{35}	mΩ/m	1.396	1.186	0.829	0.631	0.366

TEKNİK TABLO & TECHNICAL TABLE (HP-K CU)

BAKIR İLETKEN (CU)

Beyan Akımı	In	A	550	650	800	1000	1250	1350	1600
Busbar Kodu			HP-KC05	HP-KC06	HP-KC07	HP-KC09	HP-KC13	HP-KC15	HP-KC17
Koruma Sınıfı	IP55								
Standartlar	IEC 61439-6 TS EN 61439-6 IEC 61439-1 TS EN 61439-1								
Maks.Beyan Çalışma Gerilimi	Ue	Vac	1000						
Beyan Darbe Dayanım Gerilimi	Uimp	kV	8						
Beyan Frekansı	f	Hz	50						
Beyan Yalıtım Gelirimi	Ui	V	1000	Kategori IV					
Mekanik Darbe Dayanımı (IK Kodu)	Plug-in Busbar IK10								
İnsanların Korunması İçin Tedbirler	Temel Koruma (TS HD 60364-4-41, madde A1)								
Beyan Kısa Süreli Akım (1s)	Icw	kA	25	25	40	50	60	60	80
Beyan Tepe Dayanma Akımı	Ipk	kA	50,5	50,5	85	104	132	132	175,5
Nötr İletkeni İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	15,8	15,8	25	32	34	36	50
Nötr İletkeni İçin Beyan Tepe Dayanma Akımı	Ipk	kA	30	30	50,5	63,2	75,5	75,5	101
Koruma Devresi İçin Beyan Kısa Süreli Akım (1s)	Icw	kA	15,8	15,8	25	32	34	36	50
Koruma Devresi İçin Beyan Tepe Dayanma Akımı	Ipk	kA	30	30	50,5	63,2	75,5	75,5	101
20 °C İletken Sıcaklığında Direnç	R_{20}	mΩ/m	0,125	0,102	0,077	0,058	0,046	0,040	0,035
35 °C Ortam Hava Sıcaklığında Direnç	R	mΩ/m	0,165	0,140	0,100	0,074	0,059	0,051	0,045
Sıcaklıktan Bağımsız Reaktans	X	mΩ/m	0,044	0,034	0,028	0,023	0,019	0,016	0,015
20 °C İletken Sıcaklığında Empedans	Z_{20}	mΩ/m	0.587	0.491	0.395	0.297	0.252	0.200	0.170
35 °C Ortam Hava Sıcaklığında Empedans	Z_{35}	mΩ/m	0.752	0.647	0.500	0.373	0.311	0.253	0.223

	1250	1350	1600	2000	2500	2500	3000	3200	4000	5000	6300
	HP-KA12	HP-KA13	HP-KA16	HP-KA20	HP-KA25	HP-KA252	HP-KA30	HP-KA32	HP-KA40	HP-KA50	HP-KA63
	60	60	80	80	80	100	120	120	120	120	120
	132	132	176	176	180	220	264	264	264	264	264
	37	37	47,6	47,6	61	47,6	61	73	73	73	73
	75,5	75,5	101	101	132,2	101	132,2	159	159	159	159
	37	37	47,6	47,6	61	47,6	61	73	73	73	72
	75,5	75,5	101	101	132,2	101	132,2	159	159	159	159
	0.054	0.050	0.039	0.032	0.027	0.029	0.024	0.022	0.017	0.015	0.012
	0.064	0.056	0.044	0.037	0.029	0.032	0.027	0.025	0.018	0.016	0.013
	0.017	0.015	0.011	0.011	0.008	0.010	0.007	0.005	0.004	0.003	0.002
	0.236	0.224	0.181	0.140	0.112	0.120	0.105	0.096	0.081	0.059	0.044
	0.304	0.281	0.226	0.181	0.152	0.155	0.135	0.121	0.102	0.090	0.080

	2000	2250	2500	2000	2500	3300	3600	4000	4250	5000	6300
	HP-KC21	HP-KC23	HP-KC24	HP-KC22	HP-KC27	HP-KC33	HP-KC36	HP-KC41	HP-KC42	HP-KC51	HP-KC64
	80	80	100	80	100	120	120	120	120	120	120
	175,5	175,5	220,5	175	222	264	264	264	264	264	264
	50	50	50	44	58	70	70	70	70	70	70
	101	101	101	88	132,2	158,5	158,5	158,5	158,5	158,5	158,5
	50	50	50	44	58	70	70	70	70	70	70
	101	101	101	88	132,2	158,5	158,5	158,5	158,5	158,5	158,5
	0,026	0,022	0,018	0,030	0,023	0,015	0,013	0,012	0,010	0,008	0,005
	0,035	0,030	0,022	0,038	0,032	0,020	0,016	0,015	0,012	0,010	0,006
	0,010	0,009	0,008	0,012	0,009	0,007	0,006	0,005	0,005	0,004	0,003
	0.132	0.101	0.088	0.150	0.109	0.075	0.068	0.062	0.052	0.040	0.031
	0.169	0.132	0.109	0.191	0.138	0.095	0.085	0.079	0.062	0.048	0.036

İşletme akımı Ib hesabı aşağıdaki formüle göre yapılır.

$$Ib = \frac{P \times F}{\sqrt{3} \times Ue \times \cos\varphi}$$

Göz önünde bulundurulması gereken parametreler

P: Besleme yükünün toplam gücü
F: Besleme yükü kat sayısı

Besleme yükü kat sayısı gücün kullanıldığı yere göre değişkenlik göstermektedir. Her bir kullanım için hesaplanması gerekebilir. Aşağıdaki tabloda bazı kullanım amaçları ve kat sayılar verilmiştir.

Kullanım yeri:	**Kullanıcı Sayısı:**	**Kat Sayı:**
Endüstriyel	1'den 10'a kadar	0,8-0,9
Endüstriyel	10'dan 20'ye kadar	0,7-0,8
Endüstriyel	20'den 40'a kadar	0,6-0,7
Servis	Büyük ofis büroları	0,7-0,8
Servis	Alışveriş merkezleri	0,8-0,9

Ue: İşletme gerilimi (V)

Örnek: Kullanım yeri endüstriyel

Kullanıcı sayısı 15

Tek tip güç birimi 125kw

Max. İşletme gerilimi 400V

cosφ 0,95

$$Ib = \frac{P \times F}{\sqrt{3} \times Ue \times \cos\varphi}$$

Toplam güç 15x125=1875kw 1875000 (W) P

Kat sayı: 0,8

$$Ib = \frac{1875000 \times 0,8}{1,73 \times 400 \times 0,95} = 2281\ A$$

Üretici firma olarak ileride güç artırımınıda göz önünde bulundurmak gerekir. Dolayısıyla %20 bir marjin fazlalığını almanız busbarınızı güvenli kılar.

2281 A X 20% =2737 A

Kullanılabilecek akımlar 3200 A AL 3200 A CU

Kullanım yerinin sıcaklık seviyesini kontrol etmek gerekir. Busbar iletkenleri günlük ortalama 40 °C ye göre dizayn edilmiştir. Sıcaklık artışına göre busbar bir üst seviyeye çekilmesi gerekir. Aşağıdaki uygulamaya bakalım.

K : Ortam sıcaklığına göre düşürme kat sayısı

40°	1
45°	0,95
50°	0,90
55°	0,85
60°	0,80
65°	0,74
70°	0,67

Örnek : Ortalama (günlük) sıcaklık 60 °C Busbar

İşletme akımı 2737 A verilmiştir. 60 °C sıcaklığa göre

2737 A /0,80=3421 A

Ortam sıcaklığı 60 °C ise iletkenler 4000 A seçilmelidir.

Gerilim düşümü ΔV% hesabı aşağıdaki formüle göre yapınız.

$$\Delta V\% = D \times t \times Ib \times L / Ue \times 100$$

Ve aşağıdaki parametreler dikkate alınır.

D: Yük dağılım faktörü,
Besleme yönü ve noktasına göre değişen bir hat sayılır. Bu çarpan hızlı bir şekilde hesaplama yapmanızı sağlar.

D=1 Tek taraftan besleme ve son noktada çıkış alma.
D=0.5 Tek taraftan besleme ve eşit oranda çıkış alma.
T : Birim gerilim düşümü değeri Tabloda (Sayfa 115) { $t=\sqrt{3} \times 1000 \times (R \times \cos\varphi + X \times \sin\varphi)$ }
R : Direnç (mohm/m)
X : Reaktans (mohm/m)
Cos φ değerlerine göre (μV)1 ampere /m t cinsinden değerler verilmiştir.

I_b: Tüm ekstra etkili yüklerin toplamı

L: Busbar hattının toplam uzunluğu

U_e: Besleme gerilimi

Örnek: 4000 A Busbara ait hesaplama aşağıdaki gibidir. (Tek taraftan besleme son noktada çıkış alma)

(L) Hat uzunluğu	100 mt
(I_b) Etkili yük	2400 A
U_e : Besleme gerilimi	400 V
Cos φ	0,80
(D) Yük dağıtım faktörü	1

(t) Birim gerilim düşümü değeri tablodan 29,06 (V) $\%10^{-6}$

(ΔV) Maksimum izin verilen gerilim düşümü 3%

$$\Delta V\% = D \times t \times I_b \times L / U_e \times 100$$

$$\Delta V\% = \frac{1 \times 29,06 \times 10\text{-}6 \times 2400 \times 100 \times 100}{400} = 1,74\%$$

Bulunan değer %3 'ten küçüktür. 4000 A Busbar seçimi gerilim düşümü hesabına göre uygundur.

HP-K

ALÜMİNYUM	400A	500A	630A	800A	1000A	1250A	1350A	1600A	2000A	2500A	2500A	3000A	3200A	4000A	5000A	6300A		
cosφ=0,70	414,72	346,73	242,65	200,25	128,64	98,39	86,24	66,80	58,32	51,04	44,95	40,07	36,42	26,71	23,06	18,20		
cosφ=0,75	438,76	367,66	255,45	210,20	135,04	102,45	89,79	69,95	60,57	52,94	46,76	41,88	38,15	27,92	24,19	19,15		
cosφ=0,80	462,26	388,21	267,80	219,71	141,17	106,22	93,07	72,31	62,63	54,67	48,44	43,60	39,79	29,06	25,26	20,07		
cosφ=0,85	485,20	408,38	279,71	228,79	147,02	109,70	96,10	74,79	64,49	56,23	49,98	45,20	41,35	30,14	26,28	20,95		
cosφ=0,90	507,03	427,79	290,71	237,01	152,31	112,59	98,61	76,88	65,98	57,44	51,24	46,61	42,73	31,07	27,20	21,76		
cosφ=0,95	526,65	445,68	299,91	243,50	156,50	114,30	100,08	78,21	66,71	57,96	51,95	47,59	43,77	31,73	27,90	22,44		
cosφ=1	536,30	456,72	301,02	242,20	155,70	110,72	96,88	76,12	64,01	55,36	50,17	46,71	43,25	31,14	27,68	22,49		
BAKIR	**550A**	**650A**	**800A**	**1000A**	**1250A**	**1350A**	**1600A**	**2000A**	**2250A**	**2500A**	**2000A**	**2500A**	**3300A**	**3600A**	**4000A**	**4250A**	**5000A**	**6300A**
cosφ=0,70	253,86	211,30	155,49	117,86	94,79	81,41	72,92	54,67	47,38	36,47	60,76	49,81	32,82	26,75	24,31	20,67	17,02	10,95
cosφ=0,75	264,33	220,47	161,72	122,28	98,25	84,44	75,51	56,83	49,20	37,68	63,01	51,80	33,94	27,61	25,17	21,28	17,54	11,21
cosφ=0,80	274,03	229,05	167,46	126,29	101,38	87,19	77,85	58,82	50,86	38,75	65,05	53,63	34,95	28,37	25,95	21,80	17,99	11,42
cosφ=0,85	282,98	237,04	172,72	129,91	104,18	89,67	79,93	60,64	52,37	39,69	66,88	55,31	35,83	29,03	26,64	22,23	18,37	11,57
cosφ=0,90	290,40	243,86	177,01	132,73	106,33	91,59	81,48	62,11	53,56	40,34	68,30	56,67	36,47	29,48	27,16	22,49	18,61	11,63
cosφ=0,95	294,77	248,32	179,37	133,95	107,16	92,40	82	62,89	54,13	40,45	68,89	57,42	36,62	29,51	27,33	22,40	18,58	11,47
cosφ=1	285,45	242,20	173,00	128,02	102,07	88,23	77,85	60,55	51,90	38,06	65,74	55,36	34,60	27,68	25,95	20,76	17,30	10,38

HP-K TEKNİK ÖZELLİKLER

1) İlgili Standart: IEC 61439-6 TSE 61439-6
2) Tüm akım kademeleri akredite edilmiş laboratuvarlarda tip testleri olarak yapılmıştır.
3) DTM Busbar sistemleri CE İşaretine ve ISO 9001, ISO 14001 kalite sistemine sahiptir.
4) izolasyon ve işletme gerilimi 1000V ortam sıcaklığı max 40° iken max sıcaklık artışı 95 K olmalıdır.
5) Busbar gövdeleri 2,7 mm ekstrüzyon alüminyum profilden imalat edilir ve renk RAL 7038 toz boya ile boyanır.
6) İletkenler çift katmanlı epoksi boya sonrası B Sınıfı Mylar film ile kaplanır.
7) İletkenler EC-Grade olup Alüminyumdan 34 m/mm^2 Bakırda ise 56 m/mm^2 ohm'dır.
8) Koruma sınıfı IP 55/ IP 65 opsiyonel olarak üretilebilir.
9) Ek noktalarındaki Bolt On tipi Çıkış kutusu max. 1000A'dir.
10) İletken uçları kalay kaplı olup Çıkış kutusu kontak elemanları gümüş kaplanır.

Teknik Datalar

ELEKTRİKSEL KARAKTERİSTİK DEĞERLERİ

60hz. İçin sonuç 0,83 ile çarpılır.

$$DV\% = \frac{D \times t \times I_b \times L}{Ue} \times 100$$

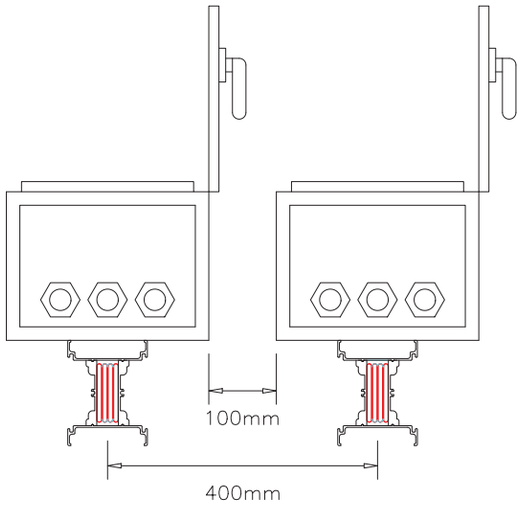
ALÜMİNYUM

Nominal	Empedans x 10-3 Ω/m faz nötr arası			Güç faktörü %							
Akım	R	X	Z	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3
400A	6,99	3,9	8,01	9,67	11,1	11	10,6	10,1	9,51	8,81	8,05
500A	6,99	3,9	8,01	9,67	11,1	11	10,6	10,1	9,51	8,81	8,05
630A	6,99	3,9	8,01	9,67	11,1	11	10,6	10,1	9,51	8,81	8,05
800A	6,5	2,31	6,9	11,2	11,2	11,4	10,7	9,94	9,08	8,16	7,18
1000A	5,2	2,07	5,6	10,7	11,5	11,2	10,6	9,91	9,11	8,25	7,33
1250A	3,5	1,72	3,9	8,17	11,3	12	12,2	12,2	12	11,6	11,1
1350A	3,1	1,62	3,5	8,58	11,9	12,7	12,9	12,9	12,7	12,3	11,8
1600A	2,5	1,28	2,9	8,65	9,71	9,57	9,21	8,73	8,16	7,51	6,81
2000A	1,9	0,43	1,95	8,21	8,2	7,68	7,08	6,41	5,71	4,99	4,23
2500A	1,5	0,68	1,65	7,78	8,54	8,34	7,96	7,49	6,94	6,34	5,7
2500A	1,4	0,14	1,45	9,68	9,14	8,33	7,47	6,58	5,68	4,76	3,83
3000A	1,15	0,37	1,21	6,03	6,90	7,74	8,52	9,24	9,87	10,34	9,94
3200A	1,02	0,33	1,08	6,49	7,43	8,32	9,15	9,92	10,58	11,08	10,63
4000A	5,2	2,07	5,6	10,7	11,5	7,68	7,08	6,41	5,71	4,99	4,23
5000A	2,5	1,28	2,9	8,65	9,71	11,4	10,7	9,94	9,08	8,16	7,18
6300A	3,5	1,8	3,5	8,65	9,71	11,4	10,7	9,94	9,08	8,16	7,18

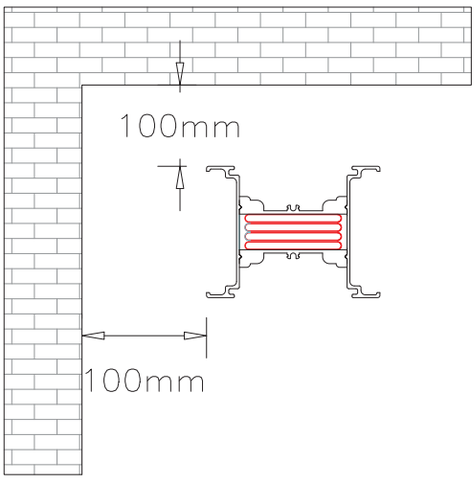
BAKIR

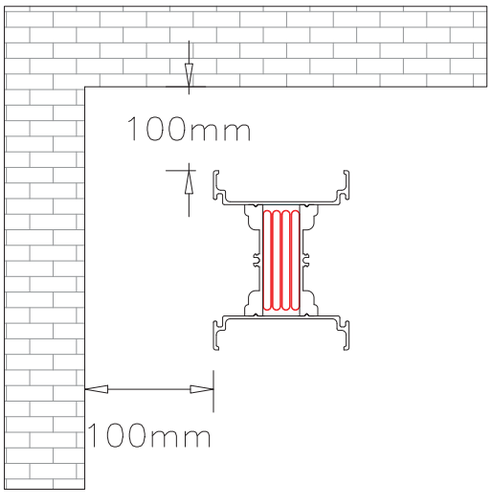
Nominal	Empedans x 10-5 Ω/m faz nötr arası			Güç faktörü %							
Akım	R	X	Z	1	0,9	0,8	0,7	0,6	0,5	0,4	0,3
550A	8,91	4,12	9,01	11,1	12,4	12,4	12,7	12,6	12,3	12,9	12,2
650A	8,91	4,12	9,01	11,1	12,4	12,4	12,7	12,6	12,3	12,9	12,2
800A	8,91	4,12	9,01	11,1	12,4	12,4	12,7	12,6	12,3	12,9	12,2
1000A	6,1	2,24	6,5	8,44	8,15	7,68	7,51	7,92	8,01	8,12	7,98
1250A	4,5	2,98	5,4	7,47	8,21	7,41	7,31	7,81	8,13	8,1	7,82
1350A	4,1	1,85	4,5	6,22	8,29	7,12	7,12	7,51	8,53	10,1	8,9
1600A	3,3	1,88	3,8	5,25	8,31	7,01	6,91	7,35	8,51	9,25	9,12
2000A	2,5	1,61	3,01	4,16	8,01	6,98	6,15	7,12	7,03	8,63	10,1
2250A	2	1,13	2,3	3,18	8,11	7,11	6,03	7,09	6,9	7,61	5,72
2500A	1,5	1,08	1,85	2,56	8,61	7,05	6,19	7,38	7,12	6,98	4,02
2000A	1,3	0,74	1,5	2,07	8,55	7,81	6,25	7,49	6,01	5,91	5,51
2500A	1	0,45	1,1	1,52	8,38	7,03	6,12	7,01	5,15	4,51	3,41
3300A	0,80	0,45	0,91	6,92	7,57	8,17	8,69	9,11	9,41	9,48	8,02
3600A	0,62	0,35	0,71	6,71	7,34	7,91	8,42	8,83	9,12	9,18	8,02
4000A	5,2	2,07	5,6	10,7	11,5	8,33	7,47	6,58	5,68	4,76	3,83
4250A	2,5	1,28	2,9	8,65	9,71	7,68	7,08	6,41	5,71	4,99	4,23
5000A	1,4	0,14	1,45	9,68	9,14	9,57	9,21	8,73	8,16	7,51	6,81
6300A	6,5	2,31	6,9	11,2	11,2	11,4	10,7	9,94	9,08	8,16	7,18

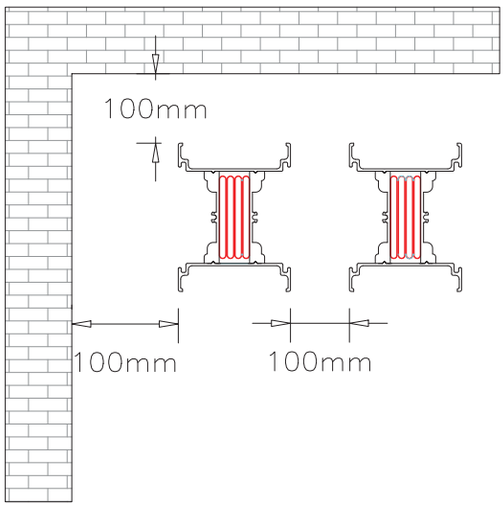
Busbar Arası Uzaklığı



Busbar Şaft İçindeki Yerleşimi







HP-K

ALÜMİNYUM BUSBAR EBAT VE AĞIRLIKLARI										
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT					FEEDER KG/MT	
	W		H	MM				FİG.	3p3w+pe	3p4w+pe
400A	118		102				25	1	5.87	6.22
500A	118		102				30	1	6.18	6.61
630A	118		102				40	1	6.82	7.49
800A	118		118				55	1	8.13	8.93
1000A	118		142	1			80	1	10.25	11.25
1250A	118		172				110	1	12.66	13.84
1350A	118		187				125	1	13.86	15.06
1600A	118	X	222		6	X	160	1	16.67	19.17
2000A	118		262				200	1	19.90	23
2500A	118		312				250	1	23.89	27.81
2500A	118		329				110	2	24.73	28.16
3000A	118		389				140	2	29.58	33.95
3200A	118		429	2			160	2	32.76	37.76
4000A	118		509				200	2	39.21	45.47
5000A	118		609				250	2	40.90	47.8
6300A	118		757	3			200	3	61.05	70.2

BAKIR BUSBAR EBAT VE AĞIRLIKLARI										
AMPER SINIFI	BUSBAR MM			İLETKEN/KESİT					FEEDER KG/MT	
	W		H	MM				FİG.	3p3w+pe	3p4w+pe
550A	118		102				25	1	9.3	10.55
650A	118		102				30	1	10.35	11.84
800A	118		102				40	1	12.34	14.32
1000A	118		118				55	1	15.44	15.7
1250A	118		132	1			70	1	20.5	23.62
1350A	118		142				80	1	21.68	25.78
1600A	118		157				95	1	25	29
2000A	118		187				125	1	31.83	38.27
2250A	118	X	222		6	X	160	1	39.72	48
2500A	118		262				200	1	48.76	59.15
2000A	118		219				55	1	31.65	35.34
2500A	118		249				70	2	38.71	45.87
3300A	118		329				110	2	56.4	67.73
3600A	118		359	2			125	2	63.1	76.1
4000A	118		389				140	2	69.87	84.33
4250A	118		429				160	2	78.95	95.5
5000A	118		509				200	2	97.03	117.75
6300A	118		636	3			160	3	145.3	176.35

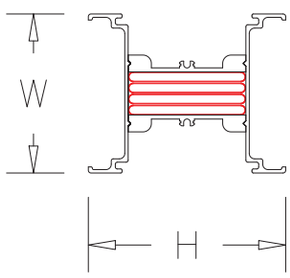


FİG 1

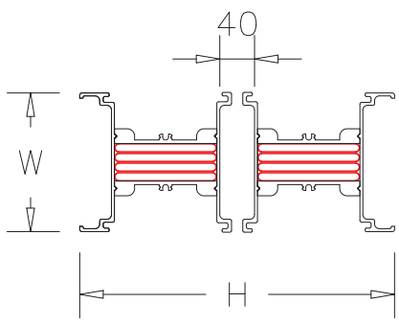


FİG 2

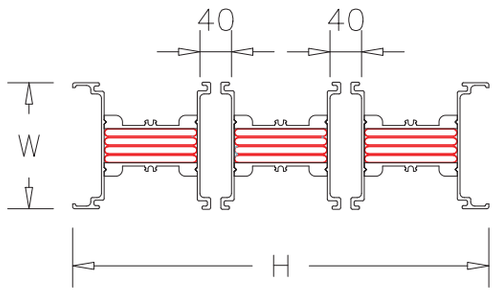
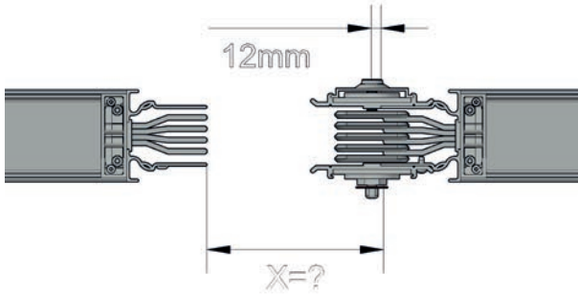


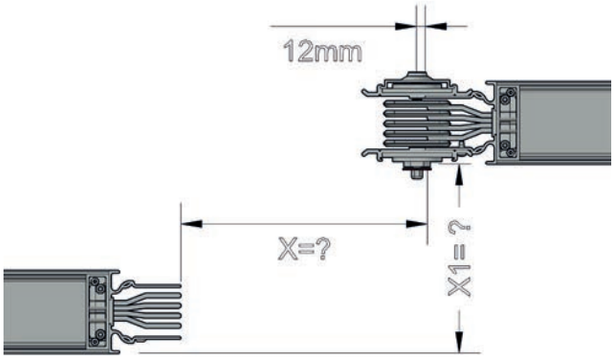
FİG 3

Ara Boy Ölçü

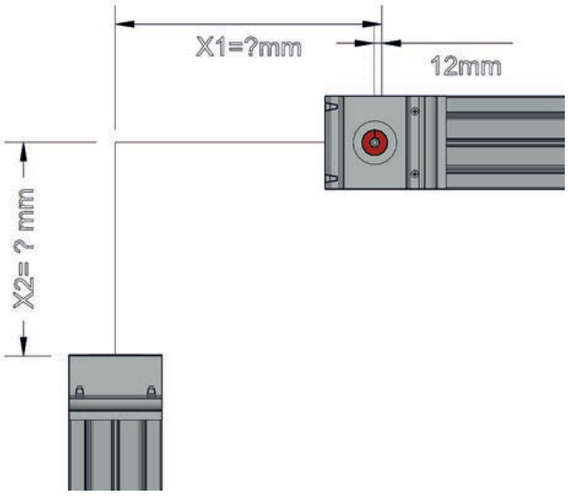
İKİ BUSBARIN EKLEME ÖLÇÜLERİ
X: ölçülen uzunluk (İLETLEN UCU DİGER İLETKEN UCU)
Örnek X=1000 mm Ek blok aralığı 24 mm'dir. 1000-24=976 mm Sipariş ölçüsü: 976mm



ÇİFT DİKEY DİRSEK ÖLÇÜ ALMA
X Ölçüleri Ek blok = 24 mm X1 Ölçüsü busbar gövde kenarından diğer busbar gövde kenarı olmak üzere ölçüsü alınmalıdır.

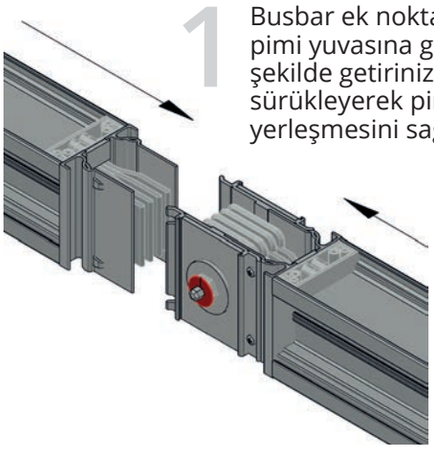


YATAY DİRSEK ÖLÇÜ ALMA
X Ölçüleri Ek blok = 24 mm X1 Ölçüsü busbar gövde merkezinden diğer busbar gövde merkezi olmak üzere ölçüsü alınmalıdır.

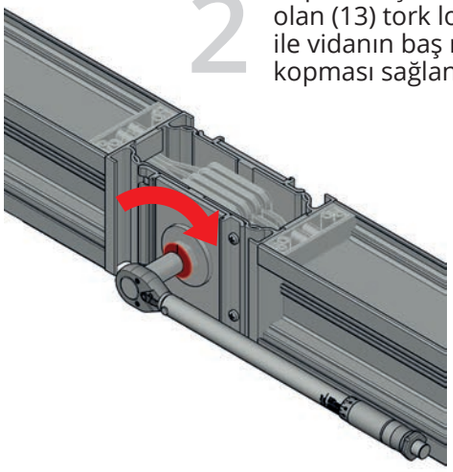


Ek Montaj Şekli

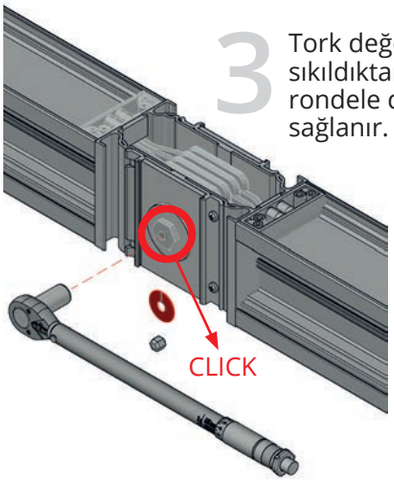
1 Busbar ek noktası hizalama pimi yuvasına gelecek şekilde getiriniz ve busbar'ı sürükleyerek pim'in yuvasına yerleşmesini sağlayınız.



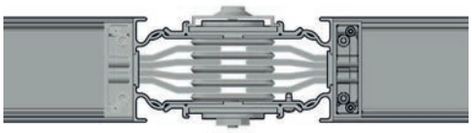
2 Kopma başlı vidanın ilk olan (13) tork lokması ile vidanın baş noktası kopması sağlanır.



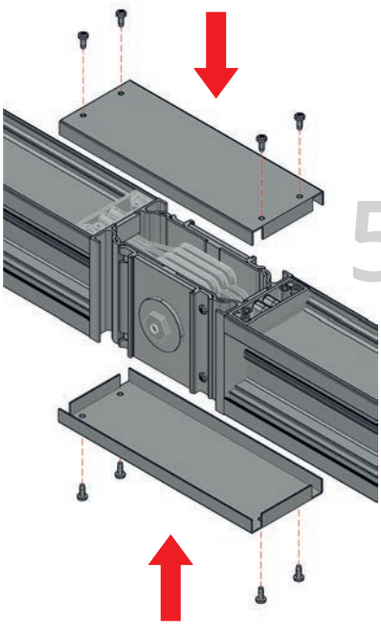
3 Tork değeri kadar sıkıldıktan sonra pul rondele düşmesi sağlanır.



4 Ek blok sıkma işlemi bittiğinde izalatörleri kontrol ediniz.

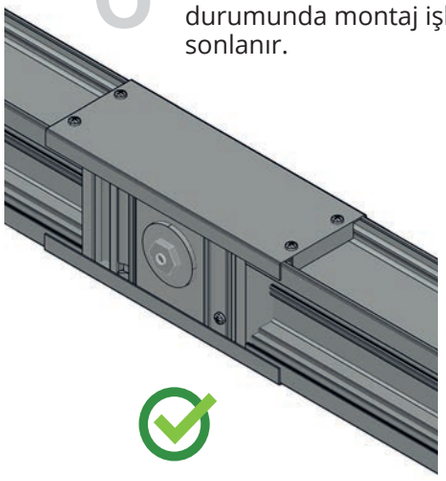


EK BLOK SIKMA DEĞERİ:
60 lbft (80 Nm)



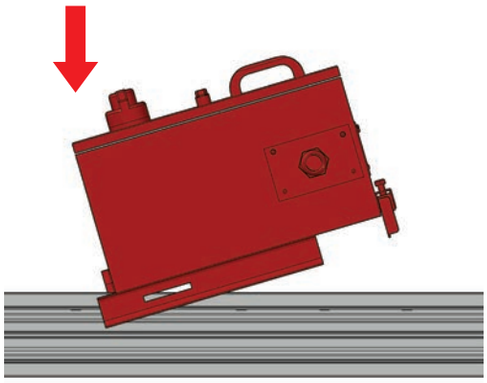
5 Ek kapaklar busbar üzerindeki merkezleme deliklerine gelicek şekilde vida yardımı ile sıkılarak montajı sağlanır.

6 Ek blok kapakları tamamen sıkılması durumunda montaj işlemi sonlanır.

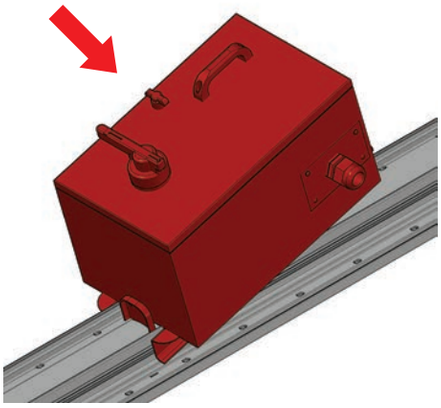


HP-K

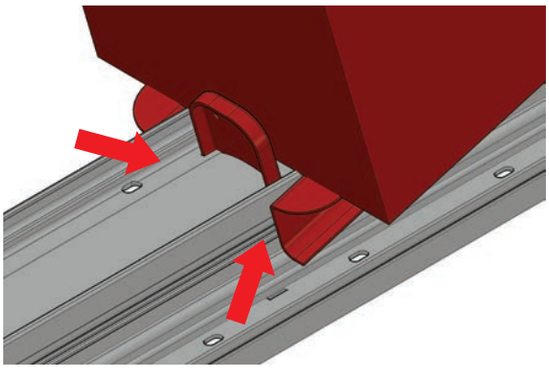
Çıkış Kutusu Montaj Şekli



1 Kutu montaj edilirken çıkış kutusunun alt giriş kısımındaki kancaya dikkat ederek gövdeye montaj ediniz.



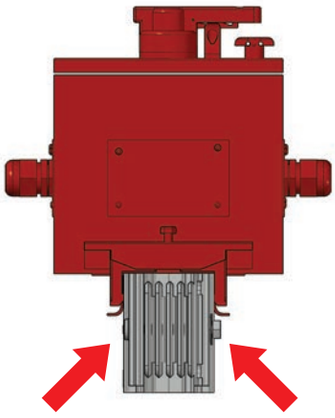
2 Çıkış kutusu üstten bastırılarak busbar'a oturması sağlanır.



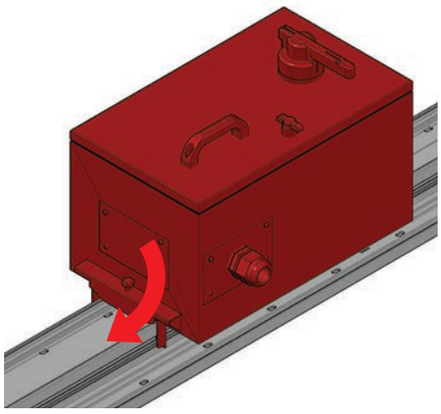
3 Çıkış kutusunun busbar gövdesine kanca sistemi yardımıyla takılmasını kontrol ediniz.

6 Çıkış Kutusu özel mekanizma yoluyla devreye alınız. Mekanizma (OFF) da iken Kapak kapatılır (ON) konumunda iken enerji verilir.

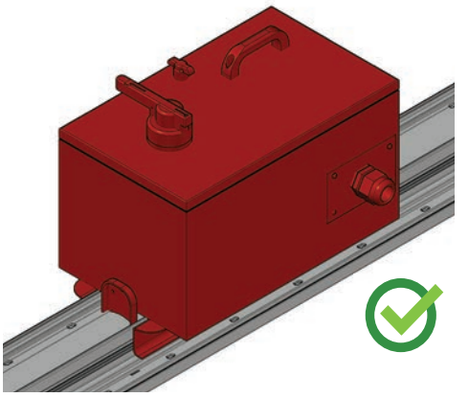
HP-K



4 Kutusunun busbar gövdesine kelepçe sistemi yardımıyla vidalanarak montajı sağlanır.



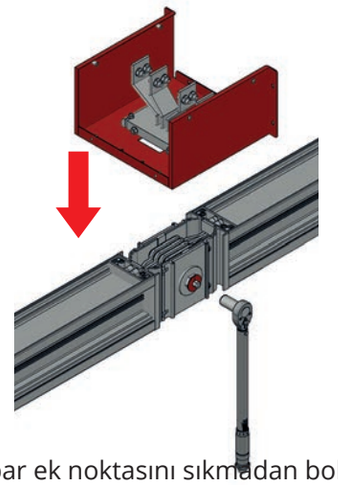
5 Kelepçe sıkılarak gövdeye sabitlenir.



NOT: Emniyet nedeniyle (ON) konumunda kutu kapağı mekanizma nedeniyle açılmasını engellenir.

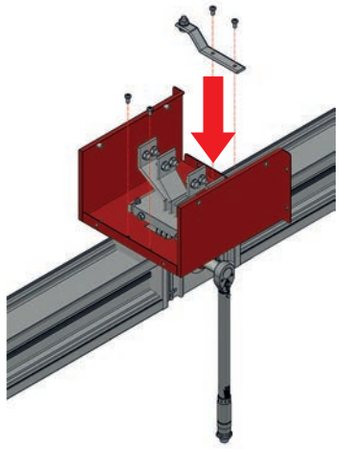
Bolt-On Montaj Şekli

1



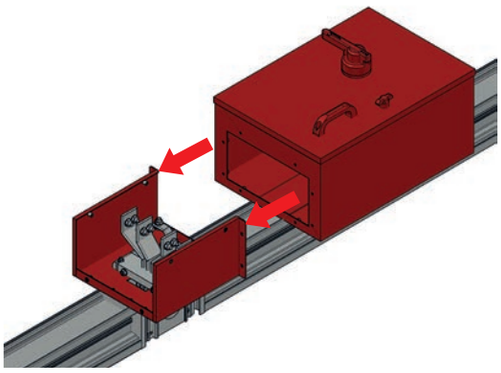
Busbar ek noktasını sıkmadan bolt-on kutusunu ek noktasına gelecek şekilde merkezine getiriniz ardından kutuyu yerleştirerek ek bloğu sıkınız.

2



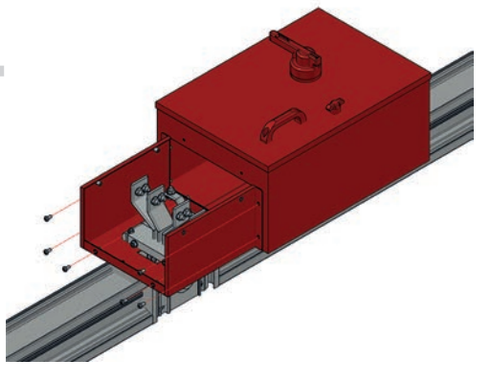
Ek yerine bolt-on kutusunu sıkıldıktan sonra topraklama iletkenini şekilde görüldüğü gibi monte ediniz.

3



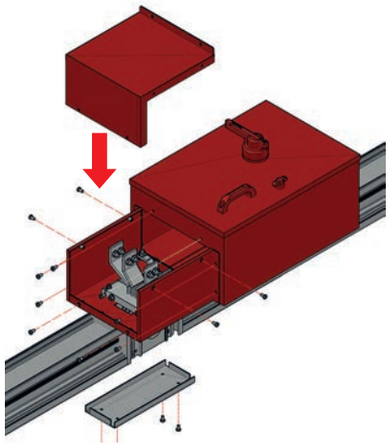
Bolt-on montajını tamamlamak için ek kutusunu busbar üzerine gelecek şekilde oturtup ek noktasına doğru kaydırınız.

4



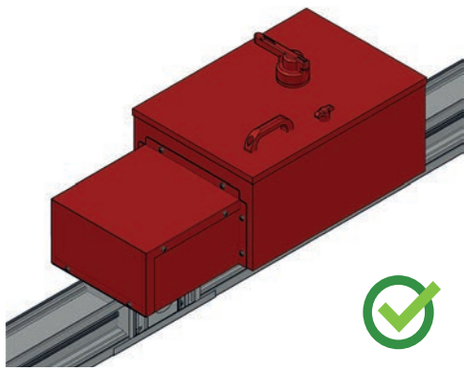
Ek kutusunu ve bolt-on arasını M6x12 vida ile sıkıştırınız.

5



Bolt-on kapağını montaj ediniz. Ardından busbar ek kapağını bağlayınız. M6x12 vida ile sıkıştırınız.

6



Bolt-on kapağının montajı ardından montaj işlemi sonlanır.

HP-K

KALİTE STANDARTLARI

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Ürün Gurubu HP-K Busbar Enerji Dağıtım Sistemleri

İmalatçı DTM Elektroteknik San. ve Tic. A.Ş.
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CE-Yönetmeliği
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Tarih
15.01.2015

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PROJE	
PROJE NO	

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